

# AAINews

APPROPRIATE AGRICULTURE INTERNATIONAL  
CO., LTD

1-2-3-403 Haramachida, Machida, Tokyo, 194-0013 JAPAN.

TEL/FAX:+81-42-725-6250 Email: aai@koushu.co.jp

## From An Apple Country

The north region of Balochistan, Pakistan is high in altitude with its capital Quetta being around 1,600 m. In this area, people have been harvesting fruits such as apples, apricots and grapes for many centuries. The land has been irrigated with karez and shallow wells. In particular, apples have become very popular as a profitable cash crop and as a result apple fields have been increasing with the rapid spread of irrigation by wells. However, the area's annual rainfall is limited (between 200 and 300 mm), and the supply of underground water cannot catch up with the use resulting that lowering underground water levels has become a serious issue.

Distinctive and highly interesting features of apple cultivation in Balochistan are the existence of "contractors" and the distribution routes. A contractor is a middle man who has a contract with farmers to buy apples from them and sell the apples in markets. Contractors buy in units of fields when the apple flowers bloom or when the apple trees start bearing fruits. After the contract has been made, the contractor will subsequently do everything from applying fertilizers and pesticides to harvesting. Contracts are usually renewable every year and contractors tend to try to maximize short-term profit without much consideration of the long-term return. Therefore in the long run, this system is not so profitable for farmers. However, they still use the system because it is a lot of work for individual farmer to grow crops as well as manage their shipment to markets. And small scale farmers, in particular, tend to seek easy money. According to a report, around 80% of farmers in the Quetta area sell their apples to contractors. Moreover, it has been pointed out, although without accurate data, the inappropriate use of pesticides and fertilizers may be exerting negative impacts on human health and on the environment in the form, for example, of contamination of soil and underground water.

As for distribution routes, most cultivated apples are at first transported to Karachi and major cities in other provinces such as Lahore. Then depending on demand, they are sent back to Balochistan little by little. This is because Balochistan does not have sufficient capacity of refrigerated storage facilities, and because the markets in Quetta are too small. These are some of the main reasons that allow the continued intervention by contractors.

Major apple varieties grown in the area are red delicious and golden delicious. Other varieties which are suitable for processing juice and jam are also grown. Generally in Pakistan, vegetables and fruits are sold per kilogram regardless of quality differences, but red delicious fetches higher prices than the other varieties of apples. This is an exception. Another exception, of course, is Karachi's high-class super markets where good quality vegetables are sold at high prices.

(Reported by Koto in Quetta)



Apple harvesting



Apples submitted at the Apple Show

## Agriculture and irrigation in arid lands: From a viewpoint of sustainability (3)

### Part 3: Falaj and oasis agriculture in UAE

One of the traditional water utilization methods for agriculture in arid regions is a system by which underground water in mountain areas is directed into plain areas using tunnel channel. This method goes by different names in different regions; in some places for instance, such tunnel are known as "qanat", in other areas they are called "karez", or "foggara" and so on. In UAE, they are called "falaj". Falaj's water is supplied into oases where date palms are grown and various crops are cultivated. In oases, people often utilize land in multiple layers; date palms in the upper layer, fruits in the middle layer, and pasture or vegetables in the lower layer. This use of space is not only very efficient, but tall date palm trees also keep temperature in oases lower than outside. Likewise they keep local humidity levels higher, as well as acting both as windbreak and shields from direct sunlight.

In oases, basin irrigation is facilitated, which is said to be a less efficient use of water compared with so-called "modern" drip and sprinkler irrigation. However, bearing such problems as salinization in mind and seen from the viewpoint of sustainable agriculture, it is debatable as to which method is actually superior. It is necessary to conduct scientific investigation on the situation and to make efforts to improve water utilization methods and apply them to some other uses.

Although this is not directly related to falaj, in Mongolia, it is said that people build their houses a certain distance from the nearest water source. This is a deliberate act; by making it difficult to fetch water the Mongolians ensure that water supplies are not overused. They are self-human desire to use as much as water available. This way of thinking is very important in arid regions with limited amounts of usable water.

Falaj also provide a limited amount of water, although the actual quantity varies from time to time. The amount of available water determines the size of cultivated areas and therefore works as a restraining force. By contrast, irrigation for agriculture is provided by underground water extracted with pumps. There is no apparent restraining factor, which could lead to irreversible results by lowering the underground water table through excessive pump extraction. If agricultural development goes beyond the productivity and scale appropriate to an area's natural carrying capacity, production may increase temporarily but it will not be sustainable. It may be that we are taking production which originally should be left for our future generations. With sustainability in mind, it is necessary to preserve some for the future. Although the theme of this essay series is "water use in arid area", given the fact that resources and food are limited, what we are talking about here may apply to the world as a whole.



A channel of falaj flowing through an oasis



Cultivation scenery in an oasis

## Nature and Agriculture in Syria (3)

### Part 3 : Mediterranean mountain regions

The mountain range which runs from the south to the north along the Mediterranean coast was formed by geological activities in the Dead Sea rift valley. To the south west of Damascus loom the steep shapes of the Haramoun mountains known for the 2,814m peak Jabal Sheikh. North of Damascus area the Qalamoun mountains rise to peaks of over 2,500m. Mountains disappear at the northern border with Lebanon, however Alawin mountains and Zawiyah mountains stretch on both sides of the Ghab lowland into the north to join mountain areas in Turkey. Rain is concentrated in winter with a large amount of snow fall in high areas that forms water sources.

Mountain areas between Damascus and Beirut are the watershed of the Barada river that flows through Damascus. They are also an important area for the production of fruits such as cherry, apricot and apple. Scattered at the foot of Jabal Sheikh, there are beautiful apple producing villages. Land utilization is advancing into the north mountain areas, and in some places, terraced fields rise up the slopes almost to the peaks, creating magnificent scenery. Silk worms have been reared in some areas for many years, but the silk business has been declining in recent times and many mulberry trees have been replaced with fruit trees. Forests of naturally occurring syndian (*Quercus calliprinos*) are seen in the area, and there are some Lebanese cedar sanctuaries.

One of the universal problems apple growers face is frost damage to flower buds due to low temperatures. People in this area have been taking counter measures which include fumigation using old tires and gasoline, and water sprinkling. Furthermore, the department of agricultural extension has recently undertaken the introduction of anti-frost fans. All apple fields are located in high altitude areas, often near the upper most tributaries of rivers. The use of fertilizers and pesticides in apple growing involves the danger of river water contamination. Regarding forestry, FAO's community afforestation project is underway. The short term goal of this afforestation activity is the production of fodder, fuelwood and fruits. In the long run, afforestation can create windbreaks and can conserve soil and wildlife. One problem of this project is the antagonism that exists between the project's executors and the local people who had previously been utilizing the land in various ways. In the future, it is an important task to develop comprehensive forest management in order to promote sustainable agriculture and stock breeding, attaining the full understanding of the local community.

Finally, related to the WID (Women In Development) issue, women in farming villages in mountain areas spend less time engaged in farming than their female counterparts in villages devoted to agriculture of crops such as wheat and cotton. Therefore, they have a high potential to develop means of acquiring additional income; by processing the fruits and nuts they produce, and by making silk textiles. The positive development of this sort of supplementary income source will be an extremely important task in the future.



## A Sketch of Pakistan (1) : "Livestock Kingdom" Balochistan

Balochistan is the biggest province in Pakistan, covering 347,000 square km, and accounting for about 44% of the whole country's land area. Due to small amount of rainfall and an arid climate, most of the province is either covered by sparsely vegetated mountains or equally sparsely vegetated desert. Only around 5% of the land is cultivated and merely half of this is cropped. As in all other arid zones, livestock breeding is very important in Balochistan. A vast area of land, which is not suitable for agriculture, is utilized as grazing land. According to the 1986 livestock census, 7.3 million goats and 11.1 million sheep are kept in Balochistan. These figures account for 24% and 48% of Pakistan's stock respectively. Following goats and sheep, Balochistan has 1.1 million cows, 6 million chickens and 0.75 million camels, donkeys and horses. The province's population is estimated to be around 7 million, or approximately 6% of the national population. Therefore, it can be said that Balochistan is a "livestock kingdom" where there are more goats and sheep than people.

There are many different breeds of sheep seen in Balochistan. The Harnai breed is good for yielding wool. High quality mutton comes from the Baloch and the Bivragh stock. As for cows, the Bhagnari on Kachhi plain is excellent for agricultural work, and the Red Sindhi in the Lasbella area is famous for being the highest quality dairy breed which is well adapted to high temperatures and arid climate. Balochistan has the Ministry of Livestock Breeding, an separate entity from the Ministry of Agriculture, which introduces new breeds and conducts research to improve existing stocks.

Grazing land in the area does not bear rich pasture. Most is called "rangeland" with poor vegetation as shown in the photographs below. Rangeland is defined as "self regenerating and self-maintaining vegetation used for livestock grazing". A FAO investigation has reported that more than 80% of livestock fodder is supplied by rangeland. Other fodder includes grass such as alfalfa, maize, sorghum and barley, as well as crop residue (wheat remained after harvesting). It seems that weeds in farmed land are also precious as fodder.

Near Quetta, some rangeland is experimentally fenced to keep livestock out. Compared with the surrounding land, there is a clear difference in forage production, which shows that there is a potential for vegetation to recover even in areas with annual rainfall of only 200 to 300 mm. However, in reality, it is difficult to fence off rangeland. This is not only because of economic reasons, but also because of complicated relationships existing with local people and nomads. Sustainable grazing in this kind of arid areas can be achieved, if degradation of grazing land can be prevented by carrying out grazing control in concert with the full understanding and participation of local people.



**Rangeland with sparse vegetation**



**Flock of goats and sheep on grazing land**