<<No.8>> December 1, 1998

AAINews

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Recent Development in Al Ain, Abu Dhabi

Al Ain is an oasis town surrounded by desert in the east of Abu Dhabi. Despite being in the middle of a vast desert, the town is surprisingly green (although most of the greenery is connected to life-support machines, or irrigation tubes). This is because Al Ain is the hometown of the current president of the UAE and has always been an important oasis town. Al Ain's "souq" (the market), where local people from UAE and Oman as well as foreign workers gather, is in the center of town. Shopping there is easy as long as one has a car. All sorts of groceries are readily available. Fish comes from Dubai and the Indian Ocean, while some vegetables and fruits are produced around Al Ain and others are imported from neighbouring countries. In big supermarkets, we can even buy tofu (bean curd) and shoyu (soy sauce). Most other Japanese food ingredients including miso (soy-bean paste) can also be obtained in Abu Dhabi or Dubai.

Emirates in the North UAE

When I first arrived in Al Ain in April 1994, my impression was of a quiet university town without the "construction rush" that can be seen in Dubai or in Abu Dhabi (indeed people from Dubai refer to Al Ain as a village.) However, unlike two years ago, there have been a lot of rumours circulating recently regarding various construction plans. These range from 20-storey hotels near the Sheikh ﾕ s palace on top of Mount Hafit (a rocky mountain of 1,200 meters in the south of the town) and the development of a spa resort at the foot of the mountain, to the construction of a Sheraton Hotel inside the public park in front of the post office, and the erection of a new shopping mall nearby.

Population flow into Al Ain seems to be increasing every year and maybe this is the motivating factor behind the various development plans. At the same time, water shortages are becoming serious each year and I heard that a water meter will be installed in each household. Some years ago it became impossible for Al Ain to supply its own water, and the town is currently dependent on water supply from sea water desalinization plants in Abu Dhabi. Is it only we foreigners who think that this arid area must now seriously consider the development of water saving irrigation methods in both agricultural development and afforestation plans. (Reported by Shoji in Al Ain)

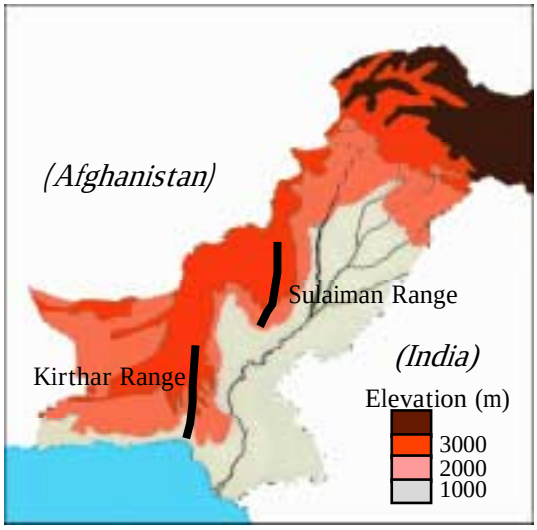
Animal souq

Modern supermarket in town

Vegetable souq

Agriculture and irrigation in arid lands: From a viewpoint of sustainability (2)

Part 2: Floodwater irrigation in Pakistan



Water harvesting is an important and traditional method of water utilization in arid regions. At the same time, the method has environmental advantages, as it is able to prevent soil erosion and salinization. It is therefore a sustainable method for agriculture which is perfectly suited to arid conditions. There are many different water harvesting methods, likewise their classifications vary. By and large though, they can be classified into two methods: 1) Rainwater harvesting that utilises ground surface water flow caused by rain; and 2) Floodwater harvesting that uses the temporary water that accumulates in wadis. The former method literally entails collecting water as rain falls on the ground surface of both agricultural and non-agricultural land. The latter method involves the collection of the water that flows in wadis by using barrages and channels, and then using this to irrigate crop fields.

In Pakistan, the main areas that undertake water harvesting reliant farming are located on the gently sloping areas at the feet of the Sulaiman and Kirthar Ranges to the west of the Indus River. Water harvesting also occurs in the western part of Balochistan province. Of these various regions, we would like to focus attention in this essay on the D.G. Khan area which is situated almost in the center of Pakistan. The D.G.Khan area is part of Punjab province and is bordered to the north by the North West Frontier province. Balochistan province borders it to the west and Sind province lies on its southern border. In the western portion of D.G. Khan the Sulaiman ranges rise to heights of over 2,000 meters and on its eastern side flows the Indus. Natural vegetation in the mountain areas is sparse and rocky terrain is exposed. The wadis that lead down from the mountains to the alluvial fans of the plains, and which only flood during heavy rains, vary in size.

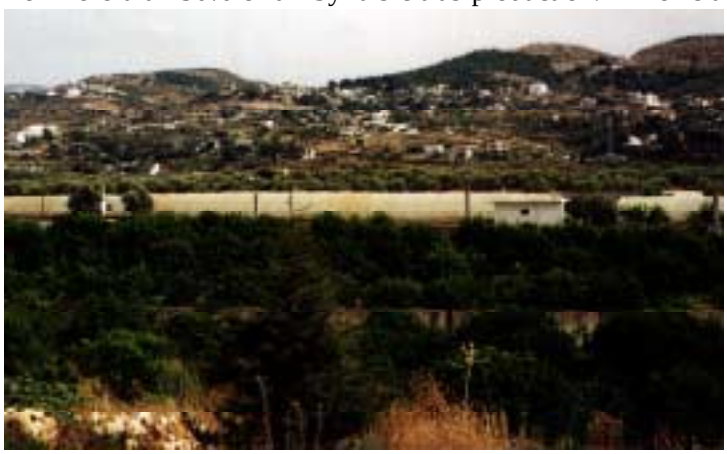
This area ﾕs water harvesting technique is called ﾒspate irrigationﾓ which is a flood-water harvesting method. This method diverts water flow in wadis, which is created by rain fall in catchment or mountain areas, just before the water reaches alluvial fans. It involves the construction of stone barrages. The water then feeds downstream farm land. Choices of crops are dependent on the potential amounts of water that can be utilized. Generally, since floods occur between June and August, sorghum and millet are planted. When the rain is late and it is possible to farm in winter, wheat is planted. Sometimes in winter months, oil bearing seeds and pulses are planted using the residual moisture for sustenance. The problem with this water harvesting method is that because it is totally dependent on unreliable flood waters, harvesting times, areas that can be cultivated and agricultural production are unstable. Also, since the comparatively recent completion of irrigation channels drawing water from the Indus, a population shift from water harvesting agricultural areas to irrigated areas began in the 1960s. Moreover, after the 1970s, population flow to countries in the Middle East prompted changes of social structure in this area. Due to these reasons it has become difficult to maintain water harvesting barrages made of mud and stones to divert wadi water into farm land,and many facilities are damaged and have lost their capacity to function. As a result, floods are sometimes causing serious damage to irrigation channels, crops and roads downstream.

Nature and Agriculture in Syria (2)

Part 2 : Mediterranean coastal regions

The Mediterranean coastal region of Syria is characterized by coastal hills of 20 to 30 km in width, sandwiched between 180 km of coast-line and mountain ranges that run parallel to the coast. At high altitudes, the annual precipitation amounts to more than 1,200 mm, and even the coastal plains have over 800 mm in rainfall per year. Due to these climatic conditions, comparatively high relative humidity (more than 65% on average) and low evapotranspiration (under 1,600 mm per year) constitute the main characteristics of this area.

Agriculture in this region is characterized by citrus crops and greenhouse vegetable farming. In particular, citrus, mainly oranges, in this area accounts for more than 90% of all Syria's citrus production. For citrus farming, the windbreak around the farm plays an important role, sustaining mild micro-climatic conditions on the land. However, if windbreaks are too thick, they could promote the breeding of pests such as white fly. Therefore, guidance for farmers is necessary, which is based on the results of experiments regarding optimum concentrations of fruit trees and the most suitable citrus fruit for various conditions. Also, in recent years, there has been large-scale damage to the citrus crop caused by the citrus leaf miner. Nonetheless, pest control without pesticides has been proved to be effective, thanks to the development of pest control methods using natural enemies at the agricultural institute. As for greenhouse vegetables, the main crops are winter tomatoes and cucumbers. New irrigation methods such as drip irrigation have been introduced – mainly to greenhouse farmers. However, because there is no sufficient comprehensive training for the operation and maintenance of these systems, the advantages of the new irrigation methods have not been achieved effectively. The promotion of bee keeping, which takes advantage of the year-round warm climate, is an important task as is the promotion of the use of bees to increase production of green house vegetables. Turning now to agricultural land use. Olives are the main crop in this area and are planted on most hills. Tobacco and peanuts are also characteristic features of agriculture in this area. In addition, the agricultural institute is carrying out experimentation to introduce crops such as bananas, coffee and tea. These initiatives have not filtered down to the farmer ד s level, however, because such crops require the protection by greenhouses during the low temperatures that occur during the winter.



Typical view of the Mediterranean coastal area (citrus in front and olive in the rear)

Regarding environmental issues, the main issue is the intrusion of sea water in farmed land. This occurred in the Damsalho area to the north of Latakia city. This area used to have many orchards mainly composed of citrus trees. Due to the over extraction of underground water for the Sports City and hotel development, however, irrigated water quality is deteriorating at speed. Some farms have already been abandoned and salinized land continues to expand. In hill regions, soil conservation on slopes is becoming an important task. Gentle slopes are mostly utilized for olive cultivation and traditional stone-walling techniques are observed. On steep slopes that cannot be used for crop production, soil conservation efforts such as afforestation are being carried out. However, more effective measures are sought, since soil erosion on some of the steep slopes is extremely severe.

Soil erosion on steep slopes

Abandoned farm due to salinization

Dew Pit Experiment at UAE University

Dew pits are generally considered to have originated in the ancient city of Jericho (in about 4,000 BC), and the oldest pit that has been found is in the Nabataean ruins. This technology was used to collect evening dew in a water scarce environment. At the Hebrew University in Israel, an experiment is being conducted to revive the ancient dew pit techniques to collect water for irrigation purposes. Also, the survival manual of the U.S. Army includes a dew pit technique as a means of securing water in desert conditions. When I was a student, I wondered whether the dew collecting technique could be used for afforestation in arid regions. Finally, I have been able to conduct an experiment. (By Shoji)

The first prototype was "open style". I dug a pit of 80 cm in diameter and 30 cm in depth, and reinforced the pit with bricks so that it would not collapse. Then a funnel-shaped polyethylene sheet was placed over the pit. I named this device "a dew pit" and measured the amount of condensation resulting from different quantities of water put into the pit. The result was that between 170cc and 1,200 cc of condensation per day was collected with one liter of water inside the one square meter of pit. The electrical conductivity (EC) was less than 0.1 mS/cm. However it is important to bear in mind that water in the pit is likely to contain high concentrations of salt. White salt accumulated on some parts of the ground surface inside this dew pit. This has become a major flaw that needs to be resolved in this method, and a new design was tried.

Dew pit (open type)

Dew pit (closed type)

The new design is a closed dew pit that uses a plastic basin and an aluminium pan. Because the plastic basin can store under ground water with high salinity, the salt accumulation on the ground can be avoided. Condensation collected per day amounted to between 700 and 1,500 cc per 1 m2 of dew pit. The photograph on the right is of Acacia raddiana which is being grown with water collected in a dew pit. Experiments on the same type of dew pit have been conducted by researchers in Papua New Guinea and Nigeria. I think that dew pits are not only useful for irrigation purposes but also useful from the view point of "access to safe water", something that is often advocated by the U.N. What do you think?

Presently, the UAE University has a total of 9 dew pit devices made of galvanized metal plates, each 1 meter in diameter. This design takes into account the need for straightforward construction design in developing nations. Three devices are placed in Sweihan in the barren land of Sabkha, taking advantage of the local conditions such as the high underground water table (50 cm) and the sterility of the land. Another three dew devices are in a place called Dabaiya, also in Sabkha, and the remaining three are set up at the University. It is planned that the daily amount of condensation will be measured and experiments and demonstrations will be carried out regarding the technology's application to the fields of irrigation and drinking water.