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AAINews

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Irrigation in the Nile Delta, Egypt and Water Users Association

For millennia in Egypt, people farmed the Nile Delta using the water from the Nile. As the soil in the Delta is clay, basin irrigation is used to grow crops such as rice, pulses, grass and vegetables. As in many other developing countries, the population of Egypt is growing rapidly, and an increase in food production is an important challenge facing the country. Therefore, agriculture has been expanded by extending irrigation channels to areas adjacent to the Nile Delta.

Irrigation channel and drainage in newly opened up farm land

I have had the chance to investigate irrigation areas in the Nile Delta from last year to this year. This time, I visited the Noubarya Area which is on the western side of the Delta. Irrigation water is channeled there via the Noubarya Canal from the Nile after being pumped up at three locations on the way. Many investors and laborers moved to the newly cultivated areas with the new jobs created here. As mentioned earlier, the soil is clay in the irrigation areas in the Nile Delta. By contrast, in the newly farmed areas, the soil is sandy, hence water saving irrigation methods such as drip and sprinklers are obligatory in order to achieve effective use of water resources. In addition, the irrigation water includes 10-15% of waste water that contains salt, to effectively exploit limited water resources.

Water Users Association members with their pennants in hands

As irrigation water is distributed via large scale channels, water use is managed through a water users association which is organized for each block in order to achieve smooth distribution of water resources. For some years after settling, we were told by chairpersons of water users association that a number of different crops could be cultivated due to irrigation, for example, wheat, alfalfa and broad beans in winter, and watermelons and various vegetables in summer. However, as the years passed by, the ground water level rose resulting in the salinization of soil. This in turn resulted in a situation whereby farmers could not continue farming because of substantial decreases in harvests. The problems were entirely caused by lack of adequate drainage systems. After requests were made to the Government, drainage systems were constructed and it became possible to resume cultivation.

A drainage channel in the Nile Delta

Water users association played a major role in establishing drainage systems by lobbying the Government to establish drainage systems. Water users association do not only bear the simple responsibility of equitable distribution of water, but also have a critical role in meeting farmers' demands, coordinating association members' opinions and acting as a window for communication with the Government. In the Nile Delta, the establishment of a water users association is often a very complicated task, as water distribution and use relates to the interests of individual residents, different interests between people up stream and down stream, and human relationships with neighboring communities. Drainage channels in the Delta are very unhygienic because of the influx of household effluent and illegal dumping of household waste. In order to promote smooth water use, JICA has been supporting the establishment and operation of water users association. In oases in arid areas, traditional water users associations have existed for centuries. I wonder whether it is possible to learn from these traditional water users associations and use these lessons in associations in newly developed farm lands.

(Zaitsu, March 2007)

Coordination between Technical Cooperation and Training Activities

Part 4 – Emphasising third country training (A case study in the field of agriculture of arid areas)

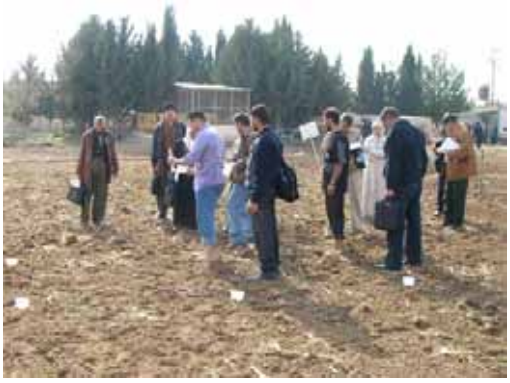
In this article, we focus on co-operation activities that involve "third country training" whereby activities are conducted in a country that has a similar environment in terms of nature, agriculture, culture and/or language to those of the trainees. The strength of this training modality is that it is easier for trainees to apply the knowledge and technology they learn from the training, on their return to their home country. In particular, we would like to make suggestions with examples of courses that target arid and semi-arid areas. Farming areas have been expanding in the world to feed an ever increasing global population. It is a critical challenge to produce sufficient food in areas with severe environmental constraints. One third of the world's land surface is arid or semi-arid. Although, in these areas, it is possible to utilize abundant solar energy, there are many environmental limiting factors such as extremely high temperatures and dryness, as well as highly limited water resources. Farming in arid and semi-arid areas constantly holds problems such as over exploitation of ground water and soil salinization. Therefore, it is necessary to ensure sustainable resource management; e.g. appropriate land use to ensure a good balance between farming and livestock husbandry, effective water resource use through introduction of water harvesting agriculture and other appropriate methods, and the crop production through the introduction of water saving technologies. It is also essential to consider the effective use of local resources including water, soil and biomass. Given this situation it is expected that the need to train people who can lead future agriculture development in arid and semi-arid areas will become increasingly important. It is crucial to ensure that the human resources in this field have a good understanding of basic cultivation techniques, as well as acquired application technologies for resource management in arid environments and for the effective utilization of local resources.

Presently, AAI is participating in a third country training program on water management techniques in irrigated farm lands that targets trainees from Iraq. This training program includes training sessions provided by counterparts in the water saving irrigation technology project currently implemented in neighboring Syria as part of the framework to promote regional co-operation. This has enabled Iraqi trainees to effectively learn, in Arabic, the irrigation technologies operating in similar environmental conditions in a different country. Moreover, through teaching, the Syrian counterparts can also enhance their understanding about the technologies. This benefits both Syrian and Iraqi participants. From our experiences, we would like to suggest the following training program.

Suggested coordination with third country training programs in arid agriculture field

Identification of arid area research and training institutions, Mutual support, Identification of good projects

Training in Japan	Mutual support	Third country training
Learning basic cultivation technique	⇒	Understanding of limiting factors in arid environments
Learning problem solving methods	⇐	Selection and application of adaptable techniques



Although it is difficult to re-create arid environment for the training courses held in Japan, these types of courses serve as an effective means for trainees to acquire general cultivation techniques, for them to be exposed to contents of research, and to visit and experience organizational activities such as those practiced by agricultural co-operatives. Possible training subjects include acquiring basic knowledge of cultivation techniques in irrigation agriculture in arid areas, details of drip and sprinkler irrigation methods for water saving, and learning calculation methods for crop water requirement. In addition to various lectures based on our experience in vegetable cultivation courses, irrigation courses and country or region specific training courses, we can introduce issues related to arid agriculture research in Japan and vegetable cultivation in sandy soil. On the other hand, in third country training programs, it is possible to conduct training under similar climatic conditions. Therefore, it is possible for trainees to understand the reality and problems of crop cultivation under arid conditions and to select and apply adaptable techniques to solve these problems. Hence it is expected that third country training courses can enhance the basic abilities acquired during training courses in Japan.

Location of third country training programs is secured in partnership with organizations that have the capacity to co-operate with JICA. Working with these organizations, supplementary training courses will be organized in third countries. The courses will include reconfirmation of knowledge and techniques acquired in a related training course in Japan. Candidate organizations include the ICARDA and the ICRISAT under the umbrella of the CGIAR, and the ACSAD, a research organization in the Arab regions. Moreover, government agencies in various countries and research centers established by JICA as part of its technical co-operation activities in countries such as UAE, Oman and Turkey would also be strong candidates. Other promising candidates are NGOs such as the permaculture organization FAMBIDZANAI and ACHRM (Africa Centre for Holistic Resource Management), both of which offer training courses in Zimbabwe. It is important to contribute to training of agricultural development personnel in arid and semi arid areas, in co-operation with these groups. As Japan is not really on the cutting edge of arid region research, third country training programs in collaboration with arid agricultural related organizations in third countries can not only train technicians in those countries but also play a role in nurturing Japanese researchers in arid area studies.

Reconsideration of Support Activities for Agriculture and Farmers – Comparison between Syria and Japan

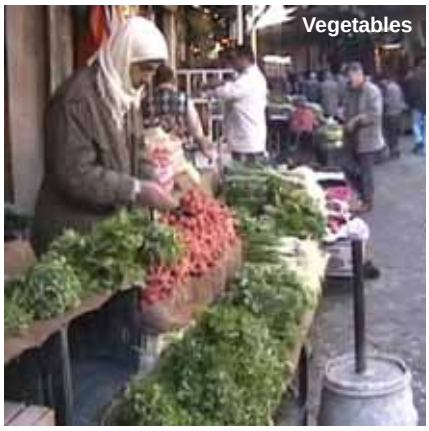
Part 4 – Shipment of agricultural products and agricultural co-operatives

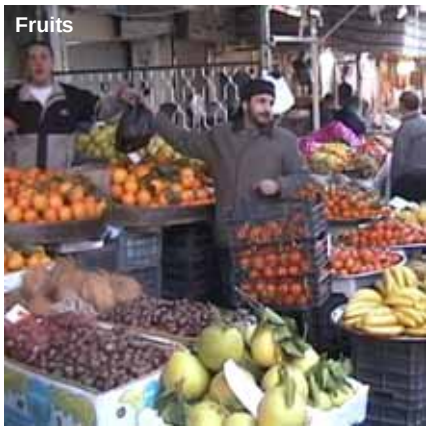
In previous issues, we discussed agricultural extension and research in Japan and Syria. In part 4 of this series, we would like to look at the future of agricultural co-operative activities in Syria, using agricultural co-operatives in Japan as parallels to enrich the discussion. Japanese Co-operatives are known as the JA group which is organized under the auspices of the Central Union of Agricultural Co-operatives (JA-Zenchu). The basic organizational unit of the JA is its members. Membership consists of full members, and associate members who are not farmers. When compared with the standards of agricultural co-operatives elsewhere in the world the JA has a system and structure that is unique. The distinctive agricultural co-operative system in Japan developed because of the post-war government's policy of total and direct control of rice distribution as stipulated by the Staple Food Control Act. Almost all Japanese farming households are full members of the JA. They are organized in regional units. There are also different levels of organizational units at the area, prefectural and national levels, forming the JA's highly unique organizational system. Another characteristic of the JA is its wide range of enterprises. These range from agricultural production-related businesses including collection and shipment of agricultural products, stock management, transport and sales, procurement of production materials and coaching in agricultural business administration, to more diversified businesses. Other JA economic activities include an advisory service for improving living conditions, provision of wedding and funeral services, garage and petrol station businesses, insurance and financing enterprises, as well as trading enterprises. This is why the JA is often referred to as a multi-purpose comprehensive co-operative.

In Syria, generally, compared to the situation in Japan, farmers seem to have a more independent spirit and try to develop their business on their own. There is also a tendency to stick to the individual family business paradigm, and one can observe a disposition not to prefer co-operation with neighboring farmers. We have little knowledge of cases where farmers voluntarily get together and organize a co-operative to collect, ship, transport and sell their products collectively. In traditional society, at the tribal unit level, people organize themselves to collect and ship milk products in a mutually supportive manner. In some agricultural villages, however, at the present time, there are cases where wealthy farmers with a vehicle collect and ship produce from neighboring farmers acting as a representative of a particular area. In these instances, though, it is more of a case of a one-to-one "contract" and therefore individualistic and businesslike. Although, farmers' organizational operations are largely inactive in Syria, agricultural co-operatives do exist. Historically, Syrian agricultural co-operatives emerged in parallel with farm land reform implemented several times after WWII. Agricultural co-operatives have been very much national government-led initiatives, spurred by land reform and the abolition of the feudal system and functioning as a means of collectivising small scale farmers. The main activity is purchase of fertilizer, seeds and production materials. Although farmers' main interests and the first principle of agricultural co-operatives are market related, businesses such as collection, shipment, distribution and sales of products have been lacking in agricultural co-operatives since their inception. In Syria, there are often top-down restrictions on planting of crops. When statesmen want to unilaterally control small scale farmers as village-level units, co-operatives are used very effectively. This point is similar to the JA's role as an agent acting between the national government and local farmers when the government's rice production control is implemented.

We have realized, through our investigation into both JA and Syrian agricultural co-operatives, that they are the products of history. Each has developed to a background of unique circumstances. It goes without saying that we cannot expect to easily draw lessons by comparing co-operatives in different countries, as the differences between countries are extremely large. However, there is one point we can make. Looking at the issue from a Syrian farmer's perspective, it seems that it is necessary to explore the possibility of organizing a production, collection and shipment system as part of the co-operative's activities. The two counterparts who studied agricultural co-operatives in Japan as part of their counterpart training program had the same idea. In Syria, there are many middlemen and farmers tend to have to sell their products at a very low price. Given this situation, it is important for farmers to collectively defend themselves and it is necessary to consider what agricultural co-operatives can do for farmers in this regard. We believe that what is needed are organized activities to achieve advantageous deals for farmers under conditions of unstable market prices. However, what should we start with? A desirable model for agricultural co-operatives is not the gigantic JA of Japan. There is also no need to explore the possibility of a desirable model based on Syria's existing government led agricultural co-operatives. The basic principle of agricultural co-operatives is mutual support among farmers. Perhaps we need to go back to the drawing board and start by organizing small-scale activities. Syrian farmers may easily accept a small group of activities or suggestions from Japanese nationals who are outsiders. With these considerations in mind, we continue our support activities for Syrian farmers.

Friday Market in Syria





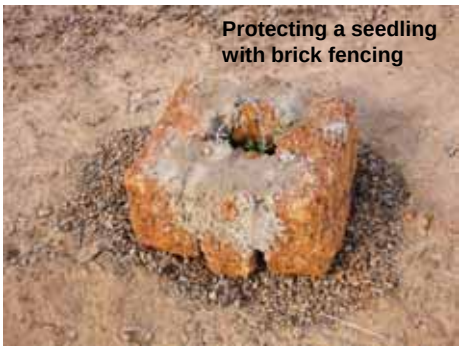
Mini Series: Sequel to "Designing Roots"

Part 4: Future potential

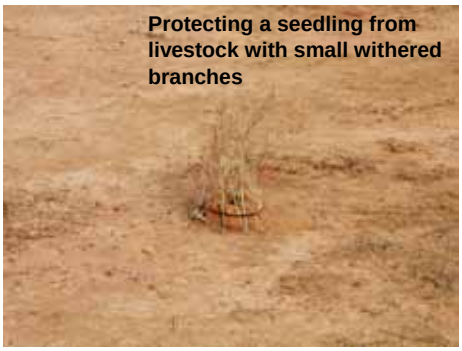
Considering land use of arid and semi-arid areas, it is recommendable that areas with fertile soil and good water availability should be used for producing food that is in short supply. Degraded areas with little topsoil and shrubs are often chosen as candidate areas for tree planting. Generally, there is a lot of such degraded land in arid areas. If we can improve vegetation in these degraded areas, pressure on the existing vegetation that remains can be alleviated. Benefits that can be derived from these lands are then more likely to have the potential to be used sustainably. Therefore, we started thinking about how we could make use of the "roots design" experiences in an effort to develop economical tree planting methods suitable for such degraded land.

In arid regions, vast degraded areas are utilized for goat and sheep grazing dependent on very scanty vegetation. In order to plant trees, one normally cultivates seedlings in nurseries and the seedlings obviously need water. In addition, in the beginning, there need to be protective measures against animals as well as provision for watering. This necessitates procuring wells and wire netting and these considerations prevent tree planting from spreading widely. Therefore, we are experimenting with ways to plant trees in a way that uses the least work and money, without using nurseries, wire netting or wells. We tried providing a minimum of water to seeds for 2-3 weeks to help seedlings settle and root in the ground and used bricks and dry branches to protect them. With this method, it is necessary to manage the roots comprehensively both above and below the ground, making the best use of brief rainy seasons. In practice, we plant seedlings with many lateral roots in the dry season and by feeding water deep underground we nurture and consolidate these deep roots. In this way, seedlings are prepared for effective utilization of rain in the rainy season. It is also important to keep a good balance between leaves and the root system by cutting off some branches and leaves to reduce water loss through transpiration so that the seedlings can survive the dry season without additional watering. The philosophy "designing roots," which started with nursing long-root seedlings, has been nurtured through a system of trial and has provided us with extremely important tips when it comes to planting trees in areas with bad conditions such as degraded lands.

Soil bricks and a seedling

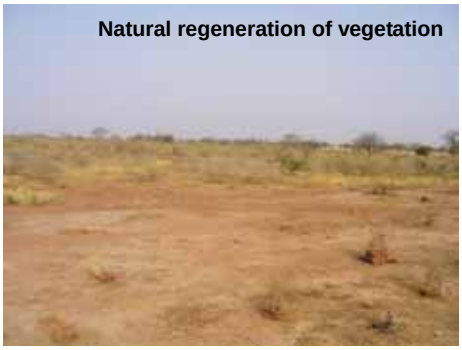


Protecting a seedling with brick fencing



Protecting a seedling from livestock with small withered branches

Once vegetation increases in degraded lands and shows natural self-regeneration we haven't just planted trees. We have "planted water"! Desertification can be considered as a situation where the amount of water that passes and stays underground becomes smaller both in the quantity of circulation between air and land surface, and in length of time of soil retention. It is considered that we can prevent desertification and restore degraded areas by increasing underground water retention and reticulation thereby slowing down the speed of water passing through the natural system. The objective of tree planting in this environment is not to generate income from forest products nor CO_2 absorption. It is for the use of people in their daily lives and making an improvement in the surrounding environment brought about by recovered vegetation. Given this, we believe that it is critical that trees are planted in a way local people can easily do without assistance. We would like to end this mini-series, with the hope that the concept of "designing roots" will be used effectively in areas facing desertification and land degradation, and that we will see an increased vegetation recovery in the future.



Natural regeneration of vegetation