Mini Series: Global Scale Environmental Measures – Reduction of Greenhouse Gases (2)

Part 2: Greenhouse gas emission from fodder production in Nejid and environmental offset with local resources

Today, the issue of global warming caused by greenhouse gas emission is widely covered in the media. The Kyoto Protocol established greenhouse gas emission reduction targets for each of the developed nations. At the same time, it is necessary to tackle global warming issues as a global environmental problem irrespective of whether one belongs to a developed nation or a developing nation. A major purpose of agriculture and rural development is for peoples' welfare, improvement of their livelihood, and poverty reduction. Actual measures include expansion of agricultural production, employment creation and nutritional improvement. In recent agricultural and rural development activities, the following principles have become a norm; 1) non-dependence on external resources, 2) effective and circular utilization of resources within a region, and 3) a participatory approach. In this story, let us examine development assistance with regard to greenhouse gas reduction.

In the Dhofar Region, in southern Oman, as introduced in AAI News (Vol. 13-18), people have traditionally had a livelihood based on livestock rearing. In the desert area in the north called Nejid, people mainly herd camels. In mountain areas they raise cattle and goats using natural vegetation sustained by the summer monsoons. In the coastal area, cattle is the main livestock raised using fodder produced by using ground water. Apart from traditional cultivation seen in the Salalah plain, the main resources for the fodder were natural vegetation sparsely distributed in the Nejid or natural vegetation which occurs during the monsoon season in mountain areas. Basically when it was difficult to obtain fodder from other areas, people adjusted their livestock farming activities to exploit the available resources of the area.


Fodder production in Nejid

In order for further development of the regional livestock industry and for the expansion of diary production, since the 1980s, there was an increasing number of large scale grass cultivation farms, using groundwater found in Nejid and the effective utilization of groundwater in the coastal plain. These grass cultivations were only possible with the harvesting of ground water and the use of chemical fertilizers and farming machinery.

This led to increasingly apparent harmful effects of development. Around the fodder producing farms, groundwater levels went down significantly due to over exploitation. Irrigation water quality worsened. Along with these phenomena, many center pivot irrigation systems were also abandoned in Nejid. In addition, in mountain areas, which supplied a large amount of pasture in the form of natural vegetation until the 1980s, overgrazing has led to the recession of suitable vegetation for pasture and the expansion of harmful vegetation. Furthermore, grazing during the seeding season has lowered productivity of grass resources.

By 1999, fodder production using the center pivot irrigation in Nejid expanded to cover 467 ha with 17 centre pivot machines. The farms produced approximately 9,900 tons per annum of fodder, according to the estimate based on cultivation record of the Nejid Agricultural Research Station (NARS). A large amount of fossil fuel, which is a source of greenhouse gases, is consumed during the fodder production, for groundwater extraction, cultivation activities, and transport of products. For instance, gas oil consumption for cultivation machinery alone reaches around 600,000 litres per year. It is also estimated that in order to transport 1 ton of fodder to Salalah, 12 litres of gas oil is necessary.

In today's Dhofar region, there is a vicious circle created by an increase in livestock numbers and an increasing dependency on fodder produced outside the area. This has caused over-utilisation of natural vegetation in the areas concerned. As a result, it has become difficult to maintain a livestock industry based on sustainable regional-level resource circulation. We hear that the Government of Oman is also concerned about the negative impacts of increasing livestock numbers, and is investigating possibilities and in some cases implementing measures such as selective reduction of livestock (camels), subsidies for the selective reduction, establishment of protected areas aiming for rangeland management and seed production during the vegetation growth period in mountain areas. It is critical to implement sound livestock management and recover and increase fodder vegetation resources with appropriate protection of the resources in the mountain area. Promoting well planned utilization of vegetation resources and full use of local resources following a natural cycle should also lead to decreased regional dependency on external resources. In addition, this conservation, development and effective utilization of local resources would also contribute to reduction of greenhouse gases and therefore prevent further global warming. In our development cooperation effort, it is increasingly important to investigate forms of assistance that also ensure reduction of greenhouse gas emission.