Adaptation and Evaluation of Integrated Rice and Duck Farming in the Hongdong Community of South Korea and the Poolmoo Schools

Knowledge Sharing and Learning in Sustainable Rice Cultivation Networks

Summary

This thesis describes and analyzes knowledge sharing and learning processes within the international network of Integrated Rice and Duck Farming (IRDF) and within the local institutional structure of Hongdong in South Korea. IRDF is used by the large majority (65-70%, around one thousand) of organic farmers in the Hongdong area. Other than there, the method has found practical application in many countries in Northeast, South East and South Asia. In those other countries, ducks have been raised and herded either near or on rice paddy fields for centuries. Thus, it is not totally clear if the invention of this method can be ascribed to one person. Based on what I learned through qualitative research in South Korea and Japan, and in literature available on the Homepages of Food and Agriculture Organization of the United Nations (FAO) and the International Rice Research Institute (IRRI), the *systematic* use of ducks to control weed, pests, and fertilization in organic rice paddy farming was invented in the late 1980's by a Japanese farmer and agricultural PhD, Mr. Takao Furuno. Those sources claim that some tens of thousand farmers use the method in this manner. A moderate number of farmers use the duck method in different areas of: Japan, the Philippines, northern, central and southern Vietnam, Laos, Papua New Guinea, Cambodia and Malaysia. A greater number of farmers per region apply the method in different areas of China, Bangladesh and India. In addition to Hongdong, there are several areas in South Korea where the method is used by more than hundred farmers per area. A few days after rice transplantation, around 10 day old duckling in a sufficient number per area (150-300 ducklings per hectare) can be released to the rice paddy fields where they control weeds by either eating or paddling down sprouts, eat the pests within reach of their beaks, and fertilize and paddle the soil. Ducks do not eat rice plants but they do have to be taken out of the rice paddies latest when the plants grow ears, which the ducks do eat.

In order to thoroughly study how actors on various levels deal with knowledge about IRDF, analytical categories were derived from theory and other research findings about knowledge sharing

and learning from both the business world and the realm of sustainable natural resource use. These insights showed that sustainable natural resource use can be supported through knowledge sharing and learning processes if these processes are understood and carried out with the right focus. This focus includes: A heterogeneous institutional structure of different groups of actors that includes collaborations between those groups, a culture of (mutual) learning, a shared focus on farmers' (and other involved actors') livelihoods, a sound mix of different knowledge types, and an adequate allocation of means.

An institutional structure that influences, and is influenced by, knowledge sharing and learning processes can be assessed by looking at different groups and institutions. Processes of learning and knowledge sharing are ways of participating in different groups of people who share their human endeavour, called communities of practice (CoP). Boundaries between such CoPs allow a deeper level of professional specialization but hamper fluid knowledge flow across the boundary. For sharing and creating new knowledge, collaborations between different CoPs have somewhat more potential than collaborations within one and the same CoPs, but the further need more effort and more means. Thus, the means for knowledge-related activities is soundly allocated by supporting knowledge brokers who bring together and mediate between different CoPs, or multimembers who experience connections between different CoPs. Information is shared and stored differently than knowledge. As knowledge is always incorporated by any actor as personal practice and experience, collaborations between members of the same or different CoPs should not just allow for a mere sharing of crude information, but for a constant adaptation of mutually exchanged knowledge in order to fit it into new natural and social environments.

In the process of adaptation and sharing of IRDF in Hongdong, the following institutions played crucial roles: the Poolmoo Schools (Highschool and College), the local Poolmoo Cooperative (Poolmoo Coop), the Mundangri Centre, and the nationwide cooperative for farming and banking - Nonghyop. The Poolmoo Coop members consist of about 200 consumers, and of 800 producers of which the large majority produce rice with IRDF. It is a spin-off from a cooperative of Poolmoo School teachers and students, and it fosters close ties to other cooperatives in the village and to consumer cooperatives in Seoul, the capital of South Korea. Another important link to the city area is the Mundangri Centre, which per year receives about 20'000 visitors from urban areas who are interested in farming life and IRDF. About the half of the population in and around Hongdong

belong to a network of the following groups: people that migrated from the city to this rural area (called refarmers), teachers, students, and graduates of both Poolmoo Schools, and members of the Poolmoo Coop and the Mundangri Centre. Within this network, people easily connect with each other: Many farmers request teachers for technical support, and teachers together with farmers and cooperative members engage in multi-party collaborations about organic farming or various other community related subjects. Farmers from the other part of local society are reluctant to address teachers or collaborating actors. They are mostly members of the local branch of the nationwide Nonghyop cooperative, which consists of about 400 organic farmers who mostly use IRDF, and of about 1'000 farmers who grow rice and other crops with conventional methods. Both networks are more or less separated, but efforts are being made from both sides to establish connections. One outcome of these efforts is a new Agricultural Information Centre which will house not only equipment to test soil conditions but also teams that engage in activities such as joint research and management of organic labels.

The fact that farmers of both networks use organic farming methods like IRDF shows that the boundary does not completely block knowledge sharing. One possible reason for this is the quality of community life in small neighbourhood groups which is inherent to Korean culture: Groups of usually 5-10 farmers (mostly men) gather in informal communities of practice that either engage in joint labour on paddy fields or chat together. This tradition of sharing thoughts in groups, face-to-face, and on a regular basis is a cultural institution that is decidedly different from Japanese society, and it influences the way IRDF is shared and applied in the two countries: Most of the farms in Japan on which IRDF is used are one of few within a region, whereas in South Korea, there are several regions where more than hundred farmers use the method. Another reason for this difference is that, especially in the organic market, Japanese farmers usually sell their products directly to consumers, whereas in South Korea, people strive to establish cooperatives with hundreds of members, or with multiple branches in which the marketing of the goods occurs.

The Nonghyop brings to the market the lion's share of rice produced in South Korea and is responsible for maintaining a fifty-fifty divide between organic and conventional farmers in the Hongdong area: Throughout the state, the Nonghyop guarantees buying half of the total conventional rice that is produced within one municipality. Because half of the farmers in Hongdong produce rice that is sold via the organic market the conventional farmers who comprise the other

half can easily sustain their livelihood with the production of conventional rice. This institutional structure hampers the efforts of actors within the Poolmoo Coop and related institutions, who strive for an area-wide implementation of organic agriculture.

The above mentioned cultural characteristic of sharing community life within small groups of neighbouring farmers is an aspect of embedded social interaction inherent to knowledge sharing processes. This notion derives from the perspective that knowledge always consists of two complementary levels - the explicit and the tacit. Thus, knowledge processes and activities need to consider not only verbal aspects of communication but also embedded social interactions like: power dynamics, ways of conceiving and relating to others, socialization, and different social roles within an institutional structure. The notion of coexisting tacit and explicit knowledge leads also to the assumption that knowledge is place-bound in the same way humans are. Thus, to settle in or near a cluster of many overlaying CoPs (like Hongdong) usually reduces the cost of accessing knowledge bearers and also allows for more trustful relationships.

The perception that knowledge is placebound has a decisive meaning in the context of agriculture: If knowledge concerning farming practice is shared across spatial distances, it always has to be adapted to new social and natural environments. Actors from different levels and regions who collaborate to bring about sustainable natural resource use thus have to understand and respect indigenous practices and have to focus not on mere adoption but on a creative *adaptation* of new techniques. Although the natural conditions in southern Japan and the west, south and east of South Korea are similar, the method was adapted differently in Hongdong. In these areas, one rice harvest per year can be yielded in the humid subtropical climate, and times for transplantation (around June 1st) and harvest (around October 10th) are very similar. The fields can be used to grow winter wheat or green manure in the remaining time. Applying ducks for one month after transplantation is enough to clear the rice paddy fields of weed. As the weeding activity is the main reason Hongdong farmers use ducks in Hongdong, most farmers simply "rent" them from a large breeding company about 150 km south of the village for one month, between around June 10th and July 10th, and give them back after the "ducks' job" is done. In Japan however, ducks are allowed in the paddies for a maximum of about two months, are taken out before rice plants come into ears in mid August, and can be sold in November.

Often, farmers face financial difficulties and thus have limited possibilities for managing different types of knowledge in order to secure their livelihood. Collaborations in the realm of farming practice thus have to consider sharing of different types of knowledge as well as shared problem perspectives on livelihoods. Most of the farmers in the Hongdong area depend largely on the income from harvests. Therefore, they are not willing to conduct or allow tests with new "adventurous" methods on their fields. When IRDF was tested in Hongdong on fields of the Poolmoo High School and of a graduate's farm, success had to be demonstrated for several consecutive years before more and more farmers of the region were willing to apply it.

The Japanese language is integrated into the curriculum of both the Poolmoo Schools, and especially that of the Poolmoo College that educates people who want to become farmers. For future organic farmers, Japanese is a kind of institutional knowledge which will enable them to benefit from the discussion and inventions concerning organic farming occurring in Japan: Most technical knowledge, as well as advanced agricultural gear originates in Japan. There is a long history of collaborations between the Poolmoo Schools and sister schools in Japan, as well as meetings between Hongdong and Japanese farmers and other farming experts. These collaborations are not self-evident, as the interactions between the two countries have not always been peaceful. For the people in Hongdong, the foundation for this collaboration is an important embedded social interaction: the official apology from teachers of the Japanese sister schools for the dread their ancestors brought to Korea during the Japanese occupation from 1910-1945.

The curriculum of the Poolmoo Schools also emphasizes other knowledge that empowers students to access different knowledge sources: All the students live in the dormitory and frequently work together on fields or engage in group activities after school. These are important opportunities to learn about embedded social interactions that make knowledge sharing and learning between each other and the teachers more fluid and long lasting.

The four organic methods that are used by rice paddy farmers in Hongdong are: IRDF, the snail-method, the rice-bran method, and the method of Winter Flooded Rice Field (WFRF). Compared to conventional rice paddy farming, these methods not only have ecologic benefits, but also economical benefits since the harvested rice can usually be sold for higher prices. Since the turn of the millennium, many farmers and farming cooperatives in South Korea applied IRDF, snail-method, or

the rice-bran method to enter the organic market, which already led to growing competition and to problems in marketing the locally produce rice through the Poolmoo Coop. All methods need good water management during the rice growing phase, and on Winter Flooded Rice Fields, this applies all year round except for the one harvest month.

When the first IRDF trials were conducted in Hongdong in 1993, most farmers who cultivated either organic or conventional rice had difficulty sustaining their livelihoods. As the method proved to be sound for organic agriculture, and as the market for organic rice boomed, farmers could count on secure incomes and thus could refrain from migrating to cities. Furthermore, more and more refarmers chose life in the area that became famous for organic farming and alternative education. Knowledge about IRDF was not just kept inside Hongdong. Mr. Ju, the first farmer who allowed tests on his fields with IRDF and who now works for the Mundangri centre, engages in teaching the method in North Korea, as well as in the bordering part within China where a minority of Korean speaking people live (Yeonbyeon). Government officials from this area also visit South Korean areas to learn IRDF and other organic rice paddy farming methods.