

TERMINOLOGY OF RICE-CULTIVATION IN JAPAN

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FOREWORD

More than twenty years have passed since this paper was read at Justus Liebig Universität, Giessen in 1970. During this period remarkable innovations have taken place in the sphere of agricultural technologies and also the socio-economic conditions relating to rice have radically changed in Japan. It is indeed true that some accounts in this paper that I've pointed out have become out of date and recent information is lacking, but this work is still worthwhile to publish today due to the following reasons:

1. The major point of rice cultivation upto 1970 has been described in global perspectives and are reflections of the older system of rice cultivation in Japan.
2. The paper has paved a way for the present author to work out *Cross-Cultural Bilingual Lexicon for Area Studies*.

THE MAIN DISCOURSE

Japan is rich in terms for rice and rice-cultivation but poor in those for wheat, wheat cultivation, cattle and cattle raising. Rice-cultivation makes up the backbone of life as well as agriculture in Japan. Major changes have been made for 20 years in implements, weed killer,

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varieties and the rice cultivation system: technological innovation has been remarkable. The development of productivity and production in general have been remarkable for these last 10 years. However, the regionalisation of rice cultivation, particularly in production and productivity, has changed during these twenty years. Inner central Japan, which was progressing, has been stagnant and rather retarded in rice cultivation. On the contrary, outer, peripheral Japan has witnessed striking progress in production and productivity of rice.

It has become one of controversial issues since 1968 how to decrease the rice production, which had before been confronted with shortage of rice and surplus of labour, as a result of the remarkable development of industrialization and urbanization. Criticism is made of farmers who live on rice in which the field and village system is organized with rice cultivation as a central figure. The social and economical system of the Nation is now on the move towards a new shape. Terms which are vital to understanding rice culture and rites have been disappearing. It is an urgent task to make the characteristics of rice cultivation in Japan clear from the viewpoint of a terminological framework. The identification of Japanese terms of rice and cultivation may be pertinent to furthering a comparative study of agricultural geography.

It would be of advantage if the theoretical and terminological framework could be carefully prepared and applied to a variety of countries. It is aimed at defining and identifying Japanese terms for rice and rice cultivation by applying the *Terminology of rice cultivation* presented by Herald Uhlig. This terminological framework is an attempt at an arrangement of the forms and types of rice cultivation and of closely related

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natural and socio-economical features in Japan and also at understanding the international position of rice cultivation of Japan. Passing reference will be made to some countries in Asia; particularly to Taiwan. It would be more profitable if an operational definition as well as a terminological framework could be shown in due course.

Major findings of a terminological study in rice and rice cultivation in Japan may be summarized as follows;

1. Labour intensive agriculture, which was proverbially called "Agriculture by sickles and hoes", has given way to mechanized farming, which is vividly reflected in new terms for transplanting tools and machines and also new English terms — no translated Japanese terms — for harvesting such as "binder" and "*jidatsu*-combine" (means auto reaping and threshing combine).
2. The social breakup of agriculture has become apparent. This is clearly reflected in the cycle of cultivation: the twofold rotation system of rice and wheat or barley is no longer widely practised by farmers. Rice-fallow has become common and also the rice-fodder crops rotation has appeared. Idle fields during the winter crop season are seen everywhere. In isolated mountain areas, many ghost villages have recently appeared. Moreover, about one tenth of rice fields are not to be cultivated in order to decrease rice production. The above social breakup of agriculture is reflected in new terms: *arashizukuri* for a field which is not properly cared for, and *kyuko*, which is a Japanese translation for fallow: the former has been commonly used for these five years and the latter has been publicized this by the Government.

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3. Many terms are escaping farmer memory which could be key words in understanding how rice cultivation developed and how the Japanese culture and way of life evolved. For instance, red rice, which is considered to be *Oryza sativa indica*, was widely cultivated in rice fields during bad conditions. Red rice had ritual significance, but this ritual has generally been forgotten. Many terms for rice and rice cultivation may be traced to the Yantse Plain and Korea, and also to South China and Southeast Asia.

4. Intensive agriculture and high productivity of rice is really characteristic of Japan. It is always one of the discussions why and how such a high level of rice cultivation has been achieved in Japan. Examination of terms for rice cultivation will give one a clue to solve these questions: rice culture complex — rice varieties, implements, manuring and fertilizing, weeding, irrigation and productivity — in various countries in East Asia and Southeast Asia reminds one of the development stages of methods, techniques and productivity of Japan.

R.1. Terms for Rice, Rice-Cultivation and Rice Cultivation Systems

R.1.1. Terms for rice;

general names for rice:

rice: *kome* 米 (Japanese), *mi* 米 (Mandarin Chinese)

names for rice-plants (and parts):

rice plant: *ine* 稻 (Japanese), *tau* 稻 (M. Chinese)

rice panicle: *ine-no-ho* or *inaho* 稻穗 (Japanese), *tau sue* 稻穗 (M. Chinese)

rice grain: *kome* 米 (Japanese), *tau mi* 稻米 (M. Chinese)

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rough, unhusked rice: *momi* 粳 (Japanese), *tau ku* 稻穀 (M. Chinese)

unhulled rice : *genmai* 玄米 (Japanese), *chaw mi* 糙米 (M. Chinese)

milled, cleaned, hulled rice: *hakumai* 白米 (Japanese), *chin mi* 精米 (M. Chinese)

(boiled) cooked rice: *meshi* 飯, *gohan* 御飯 (Japanese), *tsu fan* 煮飯 (M. Chinese)

wet rice: *suito* 水稻 (Japanese), *shue tau* 水稻 (M. Chinese)

dry rice: *okabo* 陸稻 (Japanese), *rikuto* 陸稻 (Japanese), *lu tau* 陸稻, *shan ho* 秈禾 & *po chan* 埔占 (M. Chinese), *po chan* 埔占 (Fukaen)

kind of rices: cf. R.2.1.

Generally speaking, Japanese rices are characterized by rich gluten. This is sharply contrasted with poor gluten of rices in China, Southeast Asia and India. Such sticky Japanese rice is subdivided according to the amount of gluten into two groups.

glutinous rice: *mochigome* 糯米 (Japanese), *now mi* 糯米 (M. Chinese)

less glutinous rice: *uruchi* 粳, *tada gome* 只米 (Japanese), *tsai lai mi* 在来米 (M. Chinese)

Rice in Taiwan may be normally classified into the following:

A. *Shue tau* 水稻 (wet-rice), *Oryza sativa japonica*

a. *now mi* 糯米 (glutinous rice)

b. *tsai lai mi* 在来米 (less glutinous rice)

B. *Sen tau* 秈稻 (dry rice), *Oryza sativa indica*

Sen tau 秈稻 is commonly called *po chan* 埔占 (Fukaen) and is not transplanted but it is drilled in a dry field. It need less water and fertilizer than wet rice and is cooked to make rice-porridge for breakfast.

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Red rice and white rice:

red rice: *akagome* 赤米, *akadama* 赤玉 (Japanese), *han tau* 秈稻 (M.Chinese)

white rice: *shirogome* 白米 (Japanese)

It has been discovered that rice grains of wild rice grown in Southeast Asia are mostly red-coloured. T.Morinaga pointed out that only one variety out of 25 varieties of wild rice he collected there was red-coloured and he assumed that the colour of the rice grain which was cultivated at that time was white but rice-grains were red-coloured in their incipient stage. Red rice is scarcely found in Japan. It is evidenced from the old documents that red rice was cultivated in 755. It is also evidenced from written materials that in Tosa Province both red rice and white rice were tributed as tax and areas for both varieties were equal, during the period between 1711 and 1716. However, red rice decreased in the area during the period between 1801 and 1804 with the development of land improvement. It is also reported that the area of land for red rice in 1897 in Aomori Prefecture was as much as 102 hectare even after the standardization of varieties of rice developed. Red rice plants have still remained as weeds in the rice fields and also in dry fields. It will be realized from the following ordinance of Miyagi Prefecture in 1920 how strongly red rice plants survived: Rice is not permitted to be sold in barnyards due to the fact that red grains were found mixed with dry rice grains harvested in the dry fields in Ibaragi Prefecture. Another important finding is that red rice is offered to the Deity in Japan but not in China. T.Morinaga states in his hypothesis that red-rice, as it is older, was offered to the Deity. K.Yanagida

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pointed out that red rice was served at the time of the bon festival and also at the end of the funeral ceremony in Akita Prefecture. It may be said that red rice was traditionally served during rituals but red beans are now mixed with white rice and used during rituals instead of cooking red rice. It will be pertinent to add here that red rices in Japan and Taiwan are considered to have been *Oryza sativa indica*.

Rice according to vegetative period and farming season:

short: *wase* 早稻 (Japanese)

lua chiem (Viet Nam)

srau sral (Cambodia)

boeloe (Java)

aus (Bengal, Uttar Pradesh, Bihar, Assam)

tsau tau 早稻 (M.Chinese)

medium: *nakate* 中稻 (Japanese)

boro (Bengal, Assam)

long: *okute* 晚稻 (Japanese)

uan tau 晚稻 (M.Chinese)

lua mua (Viet Nam)

srau thnung (Cambodia)

jjireh (Java)

aman (Bengal, Uttar Pradesh, Bihar, Assam)

Wet season rice and dry season rice:

Rice is usually cultivated during the warm wet season from May to October. There is no dry season rice, so all rice in Japan may safely be

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said to be wet season rice.

So-called wide-rices:

nogome 野米 — In the Amami Islands this term is commonly used.

noine 野稻 — *The compendium of agriculture* entitled *Nogyo zensho* published by Y.Miyazaki in 1679 reads “dry rice is called drought rice and also *noine* which means wide-rice”.

R.1.2. Terms (translation for terms) for rice-cultivation:

rice-cultivation:

inasaku 稻作 or *beisaku* 米作 (Japanese)

tau tso 稻作 (M.Chinese)

R.1.3. rice-cultivation systems:

inasaku keiei hoshiki 稻作經營方式 (Japanese)

tau tso chinin sin tai 稻作經營形態 (M.Chinese)

R.1.31. system, in which rice-farming is predominant:

inasaku shukan keiei 稻作主幹經營 (Japanese)

tau tso yuie chinin sin tai 稻作優越經營形態 (M.Chinese)

This system has been widely practised in Japan and Taiwan.

R.1.32. supplementary rice-farming system:

inasaku hojyo keiei 水稻補助經營 (Japanese)

tau stuo puchu chinin 稻作補助經營 (M.Chinese)

Only in more limited areas where irrigation is not available, and/or climate is not favorable, this system is practised.

R.1.322. supplementary shifting-cultivation:

shifting cultivation:

yakihata 焼畑, *kirikaebata* 切替畑, *kirihata* 切畑 (Japanese)

Kirikaebata and *kirihata* were originally used to designate a mountain field temporarily cleared without fire. However, in many parts of Japan, *kirihata* and *yakihata* are synonymously used.

tau kun ho tson 刀耕火種 (generally) (M.Chinese)

ho kun 火耕 (in the plain) (M.Chinese)

ho tson 火種 (in the mountains) (M.Chinese)

iu kun 遊耕 (translation terms for shifting cultivation) (M.Chinese)

Slash-and-burn agriculture is practised only in limited areas in mountains; particularly, in southwestern Japan. Shifting cultivation in the true sense of the term is not practised in Japan; people generally do not change their dwellings from their native villages, though the fields may be changed after a number of years. However, slash-and-burn agriculture, on a small scale, is in existence today in Japan. It has significance in a historical sense. There are historical discussions whether slash-and-burn agriculture was widely practised in Japan in the Jomon Archaeological age or not. Today cultivation of grains (rarely dry rice), and vegetables are temporary measures as a preparatory stage to the plantation of trees; mainly, Japan cedar and cypresses. (See. R.2.21.)

Slash-and-burn agriculture in Japan may be safely classified into the

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following three patterns according to major crops:

1. vegetable field: radish, rape-seed
2. crop field: buckwheat, maize, millet, red bean, sweet potato, dry rice
3. technical tree field: paper mulberry, *mitsumata* (*Edgeworthia chrysantha*)

Further, slash-and-burn agriculture may be classified into the following two patterns according to its purpose:

1. to cultivate crops:
2. as a preparatory stage:
 - (i) preparatory to meadow and/or pasture
 - (ii) preparatory to (tree) plantation

Though the practise of slash-and-burn agriculture has varied from place to place, it is a general trend to practise slash-and-burn agriculture in order to prepare for the plantation of trees, not for crop raising.

Now it is of interest to understand how dry-rice is incorporated into a slash-and-burn field, and in what part of Japan dry-rice is grown in this type of agriculture. In Nasu County in Tochigi Prefecture, dry rice (mainly *gaisen okabo*) was cultivated in slash-and-burn fields called *Kirikaebata*.

It will be adequate to refer to the ethnic and social character of slash-and-burn agriculture of Japan in comparison with South Asia and Southeast Asia. In contrast with the fact that shifting cultivation is generally pursued by hill tribes while wet rice cultivation in plains is pursued by peasants in the tropics. In Japan slash-and-burn cultivation

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was practised by peasants who are usually engaged in wet-rice cultivation. However, it is socially significant to note that poor peasants in the feudal period managed to seek a livelihood in the slash-and-burn field as its tax was fairly liberal in comparison with permanent fields.

In northern Korea, people who are called *wha chun min* engage in shifting agriculture in the mountains.

———: *A Survey of Slash-and-Burn Field*, Department of Forestry, Ministry of Agriculture, 1922.

H.Sasaki: *Slash-and-Burn Field* (The First Report of Living in Mountain Villages), 1935.

T.Furushima: *Structure of Japanese Agriculture in the Tokugawa Period*, Part 1 & 2, Nihonhyoron-sha, 1948.

M.Soma: "Slash-and-Burn Field, in Chugoku and Shikoku", in H.Ishida, *et al.* (ed.) *Chugoku and Shikoku*, Taimeido, 1960.

H.Ishida: "Kabeuchi (inside of a fence) and Kabesoto (outside of a fence)", *Special Issues in Commemoration of the 30th Anniversary of Hiroshima Shigaku Kenkyu-Kai*, 1960.

T.Sasaki: "Crops in Slash-and-Burn Field and their Crop Rotations in Japan", *Literature of Ritsumei University*, Nos. 274, 275, 1968.

Idem: "Crop Cultivation System in Slash-and-Burn Field and Regional Patterns", *Journal of History*, Vol.51, Nos.4,5, 1968.

T.Sawamura: "A Study in the Management of Slash-and-Burn Agriculture", (Nos.1-7), *Bulletin of Reclamation* (Vol.2, Nos.1, 2,3,4, 1949-1950), *Bulletin of the National Institute of Agricultural Sciences*, Series H, No.2 (No.7).

R.1.33. System of rice-growing within permanent rotations of other crops:

einen rinsaku hoshiki nai no beisaku 永年輪作方式内の米作 (Japanese)

Rice has been commonly cultivated as a staple crop within permanent rotations in areas where both irrigation and drainage are available. cf. R.4.1.

R.1.331. Wet-rice in regular rotation with other crops:

einen rinsaku hoshiki nai no suito 永年輪作方式内の水稲 (Japanese)

It is mainly wet-rice that is incorporated as a staple into permanent rotations with other crops as mentioned in R.1.33.

R.1.332. Dry-rice in regular rotation with other crops:

einen rinsaku hoshiki nai no okabo 永年輪作方式内の陸稲 (Japanese)

Dry-rice was cultivated for home consumption as one of the summer crops in permanent rotations in rainfed fields where irrigation facilities are not available.

R.2. Fields for Rice-Cultivation

R.2.1. *Wet-rice cultivation*:

Rices in Japan are firstly classified as wet or dry, secondly by glutinousness, thirdly by vegetative and farming season, fourthly by roundness of rice grain and fifthly by length of arista. Varieties of rices have come to be standardized by plant breeding to certain varieties adapted to the regional climates since the turn of the 20 century. A new variety named “*Shinriki*” spread over southwestern Japan and the “*Kame-no-o*” variety over northeastern Japan. The former was suited to the warm climate and made a wonderful rice in the yield per land unit and the latter was

fitted not only for early maturing in order to avoid the damage from cold weather but also for resistance to high fertility and disease. Further standardization and development of varieties have been made since 1930. The *Rikuu* No.132 variety has spread over Tohoku region and the *Ginbozu* variety over Hokuriku; and the *Asahi* variety has become prevalent in Tokai and Kinki and the more western part of Japan.

There are no terms for rice grown under irrigation or for transplanted rice. And no particular terms are found for irrigated rice grown in water which can be regulated by cultivators or for rice grown in standing water. This is due to the fact that irrigated rice comprise almost all wet rices in Japan. There isn't a term found for brackish water rice either.

R.2.11. Regional terms for wet-rice fields:

rice field in general:

suiden 水田 (Japanese)

shue ten 水田 (M.Chinese)

rice-cultivation areas:

suiden chitai 水田地帯, *tadokoro* 田所 (Japanese)

shue ten ti tai 水田地帯 (M.Chinese)

special type of rice field:

A. Classification by drainage and irrigation in Japan

§ . *shitsuden* 湿田 (swamp field): not drainable field

local terms: *fukada* 深田, *fukeda* 深田, *shiruta*, *zabuta*, *numata*
沼田, *awarada* 漚田, *yachida* 谷地田.

§ . *kanden* 乾田 (drained and irrigated field)

§ . *kanbatsuden* 干魃田 : wet-rice field which drought often attack

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As is noticed, *shitsuden* (swamp field) has many local names. *Kanden* (drained and irrigated field) is an ordinary wet-rice field and it has comprised a major part of cultivated land in Japan for many centuries. The *Jori* allotment system was a big civil engineering construction and regional planning and it was constructed mainly in the seventh and eighth centuries. Most rectangular patterned fields, well irrigated and drained, were constructed by this *Jori* allotment system. In the medieval ages, swamp land was reclaimed on a small scale by local powerful families. This type of small scale of reclamation was favoured not only by peasants but also by local powerful families. In this sense, swamp field had historical significance.

Nagahara, K.: "Manor system and medieval villages", *hitotsubashi-ronso*, Vol.47, No.3.

Idem: "Structure of medieval villages and feudal lords system", *Medieval Society and Economy*.

Koyama, Y.: "Villages in eastern Japan in Medieval ages and resident lords in the villages", *Journal of Japanese History*, No.90.

In Taiwan also *sui ten*, well drained and irrigated, is normal everywhere, and no particular term is given to it. Nor is there a special term for a rice field which is liable to suffer from drought. Like the richness in terms for swamp fields for rice cultivation in Japan, Taiwan is rich also in terms for swamp fields for rice: *un tsui chan* (Fukaen), *lam chan*, *chen shue ten*, etc. (M. Chinese).

A special type of cultivation is *fu ten* 浮田 (floating rice-field) on rafts

on a lake in Taiwan. It is not floating rice but normal wet-rice that grows in this floating rice field. It is evidenced from old documents that *pu tin* was seen in Mainland China from very early ages.

reclaimed wet-rice land:

shinden 新田 : in narrow sense *shinden* refers to wet-rice field reclaimed after the 17th century.

muta 沼田 : rice field reclaimed from marsh

haruda 治田, *harada* 原田 : reclaimed rice-field from waste

kawada 川田 : reclaimed rice-field from formerly river-bed

sawata 沢田 : reclaimed rice-field from swamp (*sawa* 沢 means swamp in Japanese. cf. *sawa* in Javanese)

komori 籠, *komorita* 籠田, *karami* 搦 (These terms are used in Kyushu): reclaimed rice-field of former seabed.

yamada 山田, *okada* 岡田 (means wet-rice land converted from hill), *makida* 牧田 (means wet-rice land converted from pasture), *toboshida* 唐法師田 (means a field where *toboshi* (*daitomai* 大唐米, *Oryza sativa indica*) was cultivated. See R.11)

improved wet-rice land:

ageta 揚田, *shima* 島 (elevated wet-rice land in swamp wet-rice field)

horita 堀田 (leveled wet-rice land on the hill)

hatakeda 畑田, 畠田 (wet-rice field converted from dry field)

natural dry ridge and wet land continuity:

The distribution of dry ridge, wet land and gentle slope at the foot of a

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hill varies according to the type of topography. Seen diagrammatically, the accumulation plain may be subdivided into natural levee, back marsh and the transitional zone: the transitional zone is the biggest and no particular term is given to it. A large irrigation canal was usually constructed along the outer fringe of natural levee and an artificial bank on its inner side to the river. In Okayama plain the construction of the irrigation canal and the bank and the organization of rural villages were made in the early seventeenth century and this may be about the same with the large alluvial plain in Japan.

natural wet land

shikke 湿気(田) (means wet land)

mizuta 水田 (means water-field)

banda 晩田 (means rice-field where the harvest is late)

ram chan 濫田 (swamp land) (Fukaen)

i ten 扞田 (M.Chinese): *i ten* is a natural wet field which is used for rice field when lake flood retreats. This type of *i ten* is found on a large scale in Mainland China; particularly, in the Yantse Basin.

natural dry ridges

hatada 畠田 (Japanese) (means rice field converted from dry field)

takada 高田 (Japanese) (means high rice field)

dotesuji 土手筋 (means district along a bank)

sotoda 外田 (means district outside bank)

kaketa 掛田 (rice field to be irrigated by water-wheel) as opposed to

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norita 乗田 (rice field to be naturally irrigated by irrigation canal)

kan ten 旱田 (Fukaen)

natural gentle slope (at the foot of a hill)

agari: means gentle slope which is used for cultivated field.

(i) wet-rice land which is well drained

(ii) dry-field which is too dry to cultivate rice

The relative value of different types of cultivated fields varies with the passage of time and with the change in the relative importance of crops.

R.2.12. Differentiation by water supply and control

As rice is cultivated only in the warm and wet season, there is no such term for rice grown in dry season and outside the wet season.

R.2.121. Rice-cultivation with natural water supply

rice-field where rice is grown with rainfall:

tensuiden 天水田 (Japanese)

kan ten ten 看天田 (M.Chinese)

rice-field where rice is grown with spring water:

yusuiden 湧水田 (Japanese)

chen sue ten 泉水田 (M.Chinese)

R.2.1211. In natural wet land

Permanent vegetative rice was grown in some swamps in both Japan and Taiwan.

hitsuji 糶, *matabae* 又生え (Japanese)

tsai sun tau 再生稻 (M.Chinese)

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R.2.1212. Ditto, deep water (“floating rice”)

ukiine 浮稻 (Japanese): It is reported that floating-like-rice was grown in Niigata and Shiga Prefectures. cf. *fu ten* 浮田 (M.Chinese) (See R.2.11)

R.2.1213. Ditto, brackish water rice

No particular brackish water rice in both Japan and Taiwan (cf. R.2.132)

R.2.1216. Rain-fed rice on impounded rainfall only:

rain-fed rice field

tensuiden 天水田 (Japanese)

kan ten ten 看水田 (M.Chinese)

R.2.132. Terms and types of irrigation-canal, reservoirs, wells, banks, terraces and other irrigation installation:
irrigation installations:

irrigation canal: *kangai yosui* 灌溉用水 (Japanese)

kuan kai sue chi 灌溉水渠 (M.Chinese)

tsun 圳 (Fukaen)

It will be appropriate to refer to a special method of obtaining irrigation water in reclaimed areas in southwestern Japan. Farmers know how to get fresh water in flood tide in the tidal river. During high tide, fresh water flows on salt water due to the difference of density. In the reclaimed fields where people usually have no right to the long established irrigation water, high tides were appreciated by local people. This is called as *ao* (in Saga). It is interesting to note that the similar method, which is called *lak*, has long been applied in Viet Nam.

R.2.13. Irrigated rice-cultivation

kangai suiden kosaku 灌溉水田耕作 (Japanese)

kuan kai mi tsuo 灌溉米作 (M.Chinese)

R.2.131. Terms and definitions for artificial irrigation and for terraced rice-land:

terraced rice-land:

tanada 棚田 (Japanese)

ti ten 梯田 (M.Chinese)

Wherever water is available, paddy field steps up to the hilltop and terraced rice-lands are everywhere in Japan and are subject to irrigation customs which vary from place to place.

cf. terraced dry-field

dandan batake 段々畑 (Japanese)

ti ten 梯田 (M.Chinese)

man-made pond:

ike 池, *yojiike* 用心池 (Japanese)

chu tan 池塘 (M.Chinese)

pi 埤 (Fukaen)

well:

yokoido 横井戸 (Japanese)

horiido 堀井戸 (Japanese)

tsurubeido 釣瓶井戸 (Japanese)

chin 井 (M.Chinese)

chin 井 (Fukaen)

well by windmill:

kazaguruma ido 風車井戸 (Japanese)

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Nil in M.Chinese

In some localities in Japan, this windmill was seen. It has survived in Mie Prefecture.

A large part of Japanese rice-field is irrigated by irrigation canals from rivers. Man-made ponds (reservoirs) rank next to the above irrigation canal in importance. Wells and springs play a supplementary role to the above two facilities.

irrigation installations

water-shovel:

hanetsurube 撥釣瓶 (sweep-well bucket) (Japanese)

water pipe

kakehi 掛樋 (water pipe of bamboo and of vinyl) (Japanese)

This is used mainly in mountains.

swing-bucket

himotsuki teoke 紐付手桶 (swing-bucket with strings) (Japanese)

It is evidenced from a historical document that a swing-bucket with strings was practised by two men: A patrol officer made an enquiry to a peasant as to which was more effective, swing-bucket or water wheel at the end of the 18th century.

water wheel

water wheel set in a irrigation canal:

mizuguruma 水車 (Japanese)

When using a water wheel water level is lower than the rice field, water is thus lifted up by this water wheel from a irrigation canal, to the rice field. This scene, which was once seen everywhere in Japan, has almost disappeared.

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water wheel by man:

mizuguruma 水車 (Japanese)

fumiguruma 踏車 (Japanese)

shue tso 水車 (M.Chinese)

shue chia 水車 (Fukaen)

water wheel by animal:

oguruma 大車 (Japanese)

nil in Taiwan

pump (machine)

by engine

by electricity

As is shown, there are no Japanese terms for these pumping machine in Japan. Mechanization of Japanese agriculture was initiated from water pumping. *Mizuguruma* (pedal water wheel) was widely used all over Japan. Water wheel by an animal was invented in 1911 by the farmer in the Okayama plain who suffered from shortage of irrigation water. This was followed by engine pumps in 1938 when serious drought attacked the Okayama plain. This pumping machine opened up a road to mechanizing of agriculture there.

Hiroshi ISHIDA: "Change in daught animals in connection with the development of agricultural mechanization", *Regional Studies* — *Special Issue of Human Geographical Association*, Yanagihara shoten, 1955.

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R.2.2. Dry-rice cultivation

Def.: Dry-rice (*okabo*) is rice grown in a dry field where irrigation facilities are not available. Dry-rice had spread widely for many years since the Sino-Japanese War (1894-1895). And it revived after World War II. The major producing areas lie in Ibaragi and Tochigi Prefectures. Because in Kwanto showers come from Nikko mountains every day. Generally speaking, dry-rice is produced in the Pacific littoral (upto Fukuchiyama Basin) which receives more rain than the Japanese Sea littoral. A study of dry-rice cultivation may reveal a significant aspect to the development of the Japanese and Japanese culture.

There still remains much to be discussed about which rice came to be cultivated earlier in Japan, dry-rice or wet rice. It should be considered whether these two categories of rice — dry rice and wet rice — may be fittingly applied to the rice in archaeological ages. Today, dry-rice is cultivated with rain in a field where irrigation is not available. It is cultivated mostly in permanent dry fields in level topography and partly in “slash-and-burn” fields in hilly topography. Also see R.1322.

R.2.21. Regional terms for dry (rice) fields and for shifting cultivation (sites) of dry upland and lowland rice

There is no difference of dry rice cultivated between upland and lowland. Local terms for slash-and-burn cultivation:

yakihata 焼畑, *kirihata* 切畑, *kariyama* 刈山, *kirikaebata* 切替畑, *harari* 葉刈 (Japanese)

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slash-and-burn cultivation:

tau kun ho tson 刀耕火種 (M.Chinese)

ho tson 火種 (in the plain in Mainland China), *ho tson* 火種 (in the mountains in Mainland China)

R.2.22. Terms for dry rice on permanent fields

It is true that dry rice is cultivated rather on permanent fields than on temporary fields in Japan, but farmers are not ready to cultivate dry rice on permanent wet-rice field even if there is fear of drought. Under such conditions there is a special case: It is determined by temporary rainfall conditions that either wet-rice or dry-rice is cultivated. It is said that this type of cultivation was practised in Kumamoto and Gunma Prefectures. Terms for this type of rice is as follows:

kawaki ine 乾稻 (Japanese)

kun taw 乾稻 (Korea)

In Korea this *kun taw* is cultivated in some parts in Pyung Ahn Nam To and Pyung Ahn Buck To.

R.2.3. Farming system combining wet and dry rice cultivation

okabo suite konsaku hoshiki 陸稻水稻混作方式 (Japanese)

The above case (R.22) may be a special example of farming system of wet and dry rice cultivation. Most common practice is that wet rice is cultivated in wet rice field and dry rice in dry field where irrigation is not available. Combination of wet and dry cultivation depends upon the holding of wet and dry fields, which may be attributed to topography and economic conditions of farmers. As is often stated, the proportion of dry rice cultivation in the plain area is very small while it is fairly large in

mountains where rice is grown in many cases with rainfall.

R.3. Methods and Implements of Rice-Cultivation

implements:

nokigu 農器具 (Japanese)

non chi chi 農機具 (M.Chinese)

R.31. Terms for the methods of soil-preparation

soil-preparation:

jigoshirae 地拵, *seichi* 整地 (Japanese)

tsun ti 整地 (M.Chinese)

The order of soil-preparation of wet-rice field in Japan is as follow:

(1) *araokoshi* 荒起 (plough)

Ploughing was traditionally done by bullocks, bulls, cows, and horses, but nowadays power cultivators have taken the place of animals for ploughing.

(2) *shirokaki* 代掻 (puddling)

Shirokaki is today made in water-logged field by *manga* (harrow) drawn by animal and/or by small tractor. Previously it was practiced by hoe (this method was called *kuwashiro*) in some places or by trampling of cattle in limited locality. *Shirokaki* by means of trampling of cattle was practiced in limited localities in the Satsuma Islands and south of Kyushu and Aomori Prefecture in Honshu. Traditional *shirokaki* is practiced three times: *arashiro*, *nakashiro* and *ueshiro*. Today the traditional way of puddling has been changed. (See R.3.11)

removal of weeds:

kusatori 草取, *joso* 除草 (Japanese)

tsu chann 除草 (M.Chinese)

Weeding is one of the most important works in rice cultivation in Japan where it rains in the hot season in contrast with the climate of West Europe. In passing, weeding is vital also to wheat and barley cultivation in Japan. Japanese agriculture is fittingly said to be a “war against weed”.

removal of weeds in seed bed:

nawashiro no kusatori 苗代の草取 (Japanese)

This is naturally done by hand.

removal of weeds in rice field after transplantaion:

A. traditional way of weeding

Water plays a powerful role in controlling weeds. This is clearly recognized in China and there is a special term, *Suei Tsuo* (meaning water controlling cultivation). Though there is no such a parallel term in Japan, the effect of water in controlling weed has been commonly known by peasants.

1. *ichibangusa* 一番草 (1st weeding) (Japanese)

tau pen chau 頭遍草 (Fukaen)

Soon after the transplanting of seedings, the first weeding is practised by fingers in Japan in a half sitting posture and in Taiwan in a sitting posture. *Hakkas* in Taiwan weed by toes in a standing posture with pole. The conventional three spike hoe (*tagua* 田鍬 or *gangua* 雁鍬) was used for weeding and partly for the turning over of soil. In the western part of Japan, a hoe with longer curved fingers was devised in 1823 and replaced the above small hoe. And yet the user had to almost crawl on the field. This hoe with longer curved

fingers was not replaced until 1892 by a new tool, a rotary cultivator-weeder driven by hand, which was called the “*taichi guruma*” 太一車 (after the inventor’s name) or “*tauchi guruma*” 田打車 (means tilling wheel). It was used by pushing it between the rows of rice plants. Despite the invention of hoes and a rotary cultivator-weeders, weeding by fingers in a half sitting posture had remained for many years.

2. *nibangusa* 二番草 (2nd weeding) (Japanese)

ji pen chan 二遍草 (2nd weeding) (Fukaen)

A weeding tool called *zuri* or *suri* 擦 (means “rub” or “chafe”) is pushed and pulled by hand. *The Essay on the Usefulness of Agricultural Implements* (1822) reads “this *ganzume* (spikes hoe) is used only for the first and second weedings”.

3. *sanbangusa* 三番草 (3rd weeding) (Japanese)

sa pen chan 三遍草 (3rd weeding) (Fukaen)

The same weeding tool as in the second weeding is used.

4. *hieki* 稗切 (weeding of barnyard grass) (Japanese)

Pulling barnyard grasses out is done by hand.

B. New methods of weeding

Weeding is hard work during a muggy summer. However, it is no longer so for Japanese farmers as weed killer such as 24D and PCP has been widely used. This recent trend is closely geared with part-time farming and with going seasonally out of the village to work. The prevalence of weed killer has also facilitated untransplanted rice cultivation.

sprayer: *sanpuki* 散布器 (Japanese)

tedo sanpuki 手動散布器 (handle sprayer)

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doryoku sanpuki 動力散布器 (electric sprayer)

pun u chi 噴霧機 (M.Chinese)

Method (and terms) of fertilization

burning of residual rice straw: ⁽¹⁾ This type was not generally practised either in Japan or Taiwan, but could be evidenced to have been practised from written documents there. The rice straw was reaped and used for many purposes. One of these was for manuring fields in the following three types: ash, compost and manure.

night soil:

tsubogoe 壺肥 (Japanese)

shue fee 水肥 (M.Chinese)

Night soil has been commonly used in East Asia. And it was applied to wet-rice field before the ploughing. However, honey cars and a bad smell are no longer characteristic of rural village of Japan.

animal dung:

karishiki 刈敷 (undergrowth and coarse grass trampled by animal in a stable)

mayagoe 厩肥 (cattle manure together with the above materials and straw)

niow fun 牛糞 (M.Chinese)

green manure:

ryokuhi 緑肥 (Japanese)

luh fee 綠肥 (M.Chinese)

It was one of the important jobs for peasants to collect undergrowth and coarse grass from mountains, private or common, during early summer. Peasants used to carry undergrowth and coarse grass collected

by themselves and brought it back on horse back and/or cattle back. Peasants who do not keep cattle would seasonally rent cattle and movement of cattle took place on a large scale between mountain villages and plain villages. The development of application of green manure made *karishiki* less important. Further development of the application of commercial fertilizer has made the traditional way of manuring less and less important to peasants. Fishmeal (*gyohi* 魚肥 such as *hoshika* 干鰯 (dried sardine), *nishin* 鮪 (dried herring) had been applied by rich peasants for many centuries and soy bean cakes called *mame kasu* 豆粕 (in Japanese) had been used since 1895. These two commercial organic fertilizers have been replaced by commercial chemical fertilizer. Heavy application of fertilizer also accounts for high yield of crops in Japan. However, heavy application of nitrogen and potassium has caused an imbalance between organic and inorganic matters in the soil. Worn out areas with reduced productivity have been thus brought forth. This phenomenon is known by farmers as “*akiochi*” that plant growth is stunted.

R.3.11. Types and terms for regionally characteristic implements

plough:

There are two kinds of plough: plough by animal and plough by man.

plough by animal:

karasuki, *suki* 犁, 犁 (Japanese), *li* 犁 (M.Chinese)

It has now become difficult to see the ploughs by domestic animals, which have been replaced by power cultivators in most parts of Japan. It is surprising that horses and cattle were not much in use for ploughing

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field before the Meiji Restoration while they were used for puddling a rice field. This is one of the characteristic features of Japanese agriculture and is caused mainly by climatic conditions and the resultant methods of cultivation.

It was after the beginning of the twentieth century that the plough by animal was put into practice all over Japan. The Tokugawa period witnessed the evolution of a long plough-sole. This plough was much stabler and easier to drive. On the other hand, however, this long plough-sole had much friction with the soil and not only tend to slow down the work but also made a deep ploughing difficult. In addition, the poor physique of horses in those days made this handicap greater. This long sole was used only in central Japan where cattle were dominant. The plough was not normally used in eastern Japan and far western Japan before the invention of the upright plough, which was suited for a horse (which works faster but does not have the strength of cattle, especially, a horse of such poor physique as in those days). The upright plough was produced much in Fukuoka after 1897 and rapidly spread from Kyushu to the eastern part of Japan. Thus, the distribution of ploughs in Japan may be said as follows: the long plough-sole in central Japan and the upright plough in Kyushu and eastern Japan. The merits of long plough-sole and upright plough were respectively stability and deep ploughing. Soon after the invention of the upright plough in the beginning of the twentieth century, it spread all over Japan.

long-plough-sole:

choshō ri 長床犁 (Japanese)

tsai lai li 在来犁 (M.Chinese)

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upright plough:

mottate ri 持立犁 (Japanese)

short-soled plough:

tansho ri 短床犁 (Japanese)

kai lian li 改良犁 (M.Chinese)

plough by man:

gengobei karasuki 源五兵衛耒耜: *gengobei* is an inventor's name of *karasuki*, a plough.

This plough is different from a large plough by cattle or a horse. *The Essay on the Usefulness of Agricultural Implements* reads "Gengobei Karasuki" is convenient and effective in the village where a draught animal is not available and also, even in the village where a draught animal is available, in its barley and vegetable fields.

harrow:

manga 馬把 (Japanese): harrow which is used for puddling. The etymological interpretation of *manga* is still not established. It may be interesting to note that the Indonesian terms for puddling are *mangaru* (Java) and *manga* (in Timor).

te pa 鉄耙 (M.Chinese)

hoe:

kuwa 鍬 (Japanese)

chu tou 鍬頭 (M.Chinese)

The Japanese term for the hoe is indeed *kuwa*, but all types of the *kuwa* are not included in the category of the hoe. The Japanese *kuwa* may be classified into the following three types:

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A. *uchi-hiki kuwa* 打引|鍬 (digging and hoeing *kuwa*)

B. *hiki kuwa* 引|鍬 (hoeing *kuwa*)

C. *uchi kuwa* 打|鍬 (digging *kuwa*)

The original *kuwa* was used both for weeding in the field during the vegetative period of grain plants and also for digging the field and ground in general before its differentiation in the middle of the Tokugawa Period into the above three types. As is mentioned in R.3.1., three (or four) spiked hoe was a traditional weeding implement used in the wet-rice field. It is worthwhile to note that the digging *kuwa* was developed to a degree of high efficiency of *bitchu guwa*: and also that the hoeing *kuwa* was also improved to be a special hoe suited for hoeing weeds between the rows of rice plants. Above all, the introduction of *Bitchu guwa* to eastern Japan, where ploughing by animal was extremely limited as is mentioned in R.3.11, raised the efficiency of agriculture there.

roller:

rota: no Japanese term but phonetical copy is used.

A roller has recently been introduced to pack the soil in the case of untransplanted cultivation of rice.

R.3.2. Untransplanted (wet) rice cultivation

jikimaki, jikamaki, chokuhan 直播 (Japanese)

Untransplanted (wet) rice cultivation has recently been spreading from the Okayama Plain, where it had previously been advocated by Dr. Yoshioka, but due to troubles from weeding had soon disappeared. This owes much to Dr.S.Akamatsu, who succeeded in killing even barnyard grasses by applying weed killer. This has opened a way to mechani-

zation of rice cultivation.

R.3.21. Broadcast Seed

baramaki 散播 (Japanese)

sapou 撒播 (M.Chinese)

It had been established that a wet rice seed is not broadcast in wet rice-field, but dry rice seed is broadcast in a dry field. However, even wet rice has began to be broadcast in limited areas with the introduction of the combine. (cf.R.5.1)

R.3.22. Seed by dibble in (wet) permanent cultivation

seed by dribble:

anatsuki maki 穴突播 (Japanese)

no pertinent term in M.Chinese

Wet-rice is not seeded by dibble but wheat is done.

R.3.23. Drilling (mechanical) of wet-rice seeds

suito no kikai sujimaki 水稻の機械条播 (Japanese)

tiau pou 條播 (M.Chinese)

Drilling (mechanical) of wet-rice seeds in wet-rice field before conduction water is taking the place of the traditional transplantation of seedlings. Irrigation water is conducted into the field after drill seeding and weeding is practised by weed killer.

R.3.3. Sowing in dry-rice cultivation

hata no okabomaki 畑の陸穂播 (Japanese)

sa pou 撒播 (M.Chinese)

In the level dry field in the plain, dry-rice is drilled in the same way

as R.23, but rice seed is broadcast in the case of slash-and-burn cultivation.

R.3.31. In shifting cultivation (burning, seed by dibble)

(seed in bundles):

See R.33.

R.3.4. Transplanted rice(-land)

There is no name for transplanted rice(-land), as this is common all over Japan: "Rice" usually refers to transplanted rice and 'rice-field' to transplanted rice-land. Rice plantation has been the most important and busiest practice of the cycle of rice cultivation and annual regular events have been geared to it.

R.3.41. Terms (and types) of transplanting

transplanting:

taue 田植 (Japanese)

cha ian 插秧 (M.Chinese)

The largest number of workers were required for transplanting and the order of transplanting among farm households within a village was determined by the communal custom of irrigation water. As a result, transplanting was traditionally operated on a clan or extended family basis in Japan. Exchange of labour came to be usually practised among a circle of fixed farm households after the decline of the traditional way. However, this has also given way to family labour and/or contract labour. With the mechanization of transplanting and the development of drilling (mechanical) of wet-rice seed, transplantation is no longer as labourious work as it was. Division of labour was

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traditionally clear: Women were engaged in planting and men in soil-preparation. However, this custom has not prevailed in Japan.

pulling of rice seedlings:

naetori 苗取 (Japanese)

R.3.42. Types (and terms) of nurseries (seed-beds)

seed-bed, nursery:

nawashiro 苗代 (Japanese)

hoon setchu nawashiro 保温折衷苗代 (seed bed warmed with oil paper or polyethylene sheet cover)

This new seed-bed has allowed an earlier sowing of rice seeds. The early sowing has a favorable effect on rice production in the northern part of Japan and in mountains to make the harvest time so much earlier as to avoid the cold wave in late summer which hits there frequently. The post-war increase in production of rice is caused mainly by the development of rice cultivation in northeastern Japan may be considered to have been caused largely by the early sowing and early transplanting.

The social significance of the seed-bed was big. The seed-bed is now prepared on a clan or extended family basis in Taiwan. In Japan also during the World War II, it was prepared on hamlet level. The preparation for the seed-bed has still preserved most sentimental attachment to the kinship system together with the *mochi tsuki* (rice-cake making).

R.4. Cycle of Cultivation

kosaku shuki 耕作周期 (Japanese)

sakutsuke jyunjyo 作付順序 (Japanese)

R.4.1. Cultivation of permanent wet-rice fields

permanent rice cultivation

einen inasaku 永年稲作 (Japanese)

If the term of permanent cultivation is interpreted as yearly successive cultivation of a same crop, it must be stated that permanent rice cultivation has been practised from the incipient stage of Japanese agriculture. However, the cycle of cultivation is usually understood and actual enforcement of policies was usually put into practice on a seasonal basis — summer (warm half of the year) and winter (cool half of the year). This is contrasted with the fact that *permanent*, *cycle*, etc. are understood on an annual basis. If the conventional notion of “permanent” is taken here, permanent rice cultivation is not practised as it is too cold to grow rice in winter and this is also the same with Formosa.

R.4.11. Rice-fallow (one-field system)

ine tansaku 稲単作 (Japanese)

ine ichimosaku 稲一毛作 (Japanese)

Today the one-field system of rice is seen in paddy fields beyond the northern limit of winter crops in paddy fields. This system is seen also in mountains south of the above line.

R.4.111. Type of fallow

fallow:

kyukan 休閑, *kyuko* 休耕 (Japanese)

The right term of fallow is not *kyuko*, but *kyukan*. The term ‘*kyukan*’ has been long established in an academic circle, but only

recently “*kyuko*” has been popularly publicised. It may be safely said that the fallow through whole year as is seen in western Europe has never been practised in Japan. It must be remembered that the absence of winter crops (or summer crops) bears the role and significance of the fallow in areas where double cropping is common. It is evidenced that this *winter crop fallow* was prevalent not only in eastern Japan but also in western Japan; It is revealed from the *Nation-wide Statistics of Japanese Agriculture, 1884* that this type of fallow comprised three-fourths of the area under rice cultivation.

water-fallow:

tansui kyukan 湛水休閑, *tansui kyuko* 湛水休耕, *toki kyukan* 冬期休閑, *toki kyuko* 冬期休耕 (Japanese)

In the case of the above rice fallow (R.4.111), most paddy fields remains undrained. This may be categorized into water-fallow, which may be termed *tansui kyuko*. The merit of water-fallow in the winter crop season was realized by peasants, and also clearly written in the authentic book on agriculture.

ploughed fallow:

This is seen south of the above limit and this may be termed *riko kyuko* 犁耕休耕. As it was known that one more bag of rice (60 kg) was harvested with less fertilizer in the case of ploughed fallow in southwestern Japan, rich farmers often practised this type of fallow.

fallow with growing of green manure:

This may be termed *ryokuhi sakutsuke kyuko* 緑肥作付休耕. Among

green manures, Chinese milk vetch (*Astragalus sincicus L.*), and rape seed are most important. It was after the period between 1925 and 1939 that cultivation of Chinese milk vetch spread widely when the Japanese Government enthusiastically advocated the effectiveness of this method.

R.4.112. Rice-other crops (in rotation)

ine rinsaku taikei 稻輪作体系 (Japanese)

crop rotation:

sakumotsu rinsaku 作物輪作 (Japanese)

1. rice-wheat rotation
2. rice-barley rotation
3. rice-rush (*igusa* 藎草) rotation
4. rice-tobacco rotation
5. rice-fodder rotation
6. rice-vegetable rotation
7. rice-rice-fallow rotation

It is seen now that rice-wheat rotation is giving way to rice-fallow and/or rice-fodder crop (or other crop) rotation. However, it is revealed by the documents that the rotation system of rice (summer crop)-winter crops (barley or wheat) was widely spread and firmly established after the Sino-Japanese War. It was rice-barley (including naked barley) rotation that Japanese farmers traditionally practised. Since the World War I, the rice-wheat rotation has gradually spread and towards 1940 two patterns of rotation match each other in its area. However, rice-wheat rotation become, after the World War II, the dominant pattern of crop rotation in Japan. It has

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changed since the increased importation of wheat. Today rotation of rice-fodder crops and of rice-vegetables is rapidly increasing. The cultivation of fodder crops and vegetables has developed to take the position of the first crop in some areas instead of rice. Double-cropping of rice, which become popular in Kochi Prefecture and in some other places in southwestern Japan for some years, has now decreased. (See R.4.121)

Crop rotations in Taiwan are as follows:

1. wet rice (*sue tan*) - wet rice - green manure (*luh fue*)
2. wet rice - sweet potato (*kan su*)
3. wet rice - wet rice - vegetable (*su chai*)

R.4.113. Rice and other crops mixed (“intercropping”)

ine tono konpa 稲との混播 (Japanese)

chia kun tau 夾根稻 (M.Chinese)

Rice and other crops mixed (“intercropping”) is partially practised both in Japan and in Taiwan. It is seen that Chinese milk vetch is sowed between rows of rice plants before harvest and a cutting of sugar cane is planted between rows of rice plants (See R.4.112). Different type of intercropping is seen both in Japan and Taiwan. Two kinds of rice whose vegetative periods were the same were grown in the same plot. In Japan this was seen in rice-fields on mountains when normal rice varieties were endangered by cold-water damage. On the major part of rice field normal varieties were used, and red rice was cultivated only near the inlet of water in high altitude. In Taiwan, also two kinds of rices, whose vegetative period is different are planted in the same plot in fear of damage. A similar method was applied also in

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Japan: there was a custom called *nikisaku* (means two cropping in Saga Prefecture) that early varieties were grown in two-thirds of a plot and late varieties in one-third of the plot. This was not the case only with Saga Prefecture but with all over Kyushu.

R.4.121. Rice-rice

suito nikisaku 水稻二期作 (Japanese)

lian chi sue tau 兩期水稻 (M.Chinese)

Double cropping of paddies in the form of rice: Rice is practised only in a limited area of Japan while it is common in Taiwan. It is evidenced that double cropping of irrigated rice was practised as early as 1790 in Kochi Prefecture. This type of double cropping came to its high zenith during the period between 1931 and 1936 in Kochi Prefecture and suddenly declined, but after the World War II this method spread to some other areas outside Kochi. This type of rotation has again decreased in Kochi as well as in other regions.

S.Kubo, M.Okumiya: *Retrospect and Prospect of Double Cropping of Rice*, Kochi City Library, 1954.

S.Kubo, S.Kajihara, R.Hashida: *A Study in Double Cropping of Rice*, Kochi City Library, 1958.

O.Yamasaki: "Development of Double Cropping of Rice in Kochi Prefecture", *Human Geography*, 1953.

R.4.122. Rice-rice, one or both crops mixed with other crops ("intercropping")

No practice and no term both in Japan and Taiwan.

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R.4.13. Continuous cropping of rice (“triple-cropping”)

No practice and no term (Japan)

R.4.14. Threefold rotation: rice-other crops-rice

sanmosaku 三毛作 (Japanese)

san chi sue tau 三期水稻 (M.Chinese)

This type of threefold rotation: rice-other crops-rice, has not been pursued in Japan, while threefold rotation is practised in dry field: vegetable, barley and bean.

In Taiwan threefold rotation with double cropping of wet rice is pursued in various patterns: Some examples are shown below:

1. rice (III, IV-VII) — rice (VII, VIII-XI) — green manure

2. rice (III, IV-VII) — rice (VII, VIII-XI) — vegetable (XII-1,2)

R.4.2. Temporary (shifting) cultivation of (dry-) rice

See R.1.332.

R.4.21. Temporary (shifting) cultivation (dry upland or dry lowland rice)

See R.1.332.

R.4.22. Ditto medium cycles

Also see R.1.332.

R.4.312. Irrigated rice, changing in long-term rotation with other crops

No pertinent cultivation in Japan.

In Taiwan two years rotation is pursued as follows:

wet rice (III, IV-VII) — wet rice (VII, VIII-IX) — suger cane (X-I, II) — green manure (V-XI) — suger cane (XII-III)

R.5. Harvesting

R.5.1. Methods (and implements) of rice-harvesting

sickle:

kama 鎌 (Japanese), *len tau* 鎌刀 (M.Chinese)

Japanese agriculture is often called “agriculture by means of hoe and sickle” and the edge of the sickle for reaping rice is not jagged while that of the barley sickle is jagged. Banshu *gama* and Shinshu *gama* are well-known for their quality and production.

hand-knife:

No pertinent knife for rice-harvesting in Japan.

(mechanical, combined) harvester:

Various type of harvesters in Japan will be listed according to the process of terminological innovation.

1. *kogihashi* 扱箸 or *hasami-bashi* 挟箸 or *hashi* 箸 (stripping stick)
2. *senbakogi* 千齒扱 (multi-bladed stripper)
3. *ashi fumi dakkokuki* 足踏脱穀器 (pedaling type of rotary thresher)
4. *chikuryoku dakkokuki* 畜力脱穀器 (rotary thresher by animal)
5. *doryoku dakkokuki* 動力脱穀器 (power thresher)
6. binder; *kessokuki* 結束機 (reaping and binding)
7. *jidatsu* combine 自脱コンバイン: combine for reaping and threshing

Each tool and machine contributed much to save labour and gave significant influence to the production and society. For instance, the multibladed stripper was so efficient that widows who had been employed every harvest time by big peasants were no longer employed, and this tool was called “goketaoshi” which means “discharger of

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widows". This tool contributed much to increasing the area for growing barley and wheat as a second crop of the rice field in the western part of Japan. Owing to the efficiency of the peddling type of rotary thresher, it became unnecessary for even big farmers to employ a baby tender in harvest time. These have now become old tales. Today the prevalence of power thresher is so great that old peddling type thresher can hardly be seen anywhere. Moreover, combines came to be used in large farming households. It may be suggested that diffusion of binders is so remarkable that sickles will no longer be used by Japanese farmers.

R.5.2. Methods (and implements or installation) for threshing:

drying, storage, hushing, milling etc, of rice:

threshing by trampling by feet:

no pertinent case in Japan

threshing by trampling by buffalo:

no pertinent case in Japan

threshing by machine:

See R.5.1.

drying in rice field:

There were two methods of drying in rice-field before threshing in Japan:

(1) *jiboshi* 地干 (drying ears and stalks of wet rice on the surface of rice field)

In most cases, rice plants binded are heaped up to make a rice stack called *inazumi* 稲積 or *hozumi* 穂積. In other cases, they are sent

directly to the threshing machine.

(2) *inaka, inaga* 稻架 (drying ears and stalks of wet rice being bound and hung over log or bamboo fence-like establishment)

drying on hard ground:

Unhusked rice after threshing is dried on the mat on hard ground in front of the house. This is called *kadoboshi* 庭干 or *mushiroboshi* 筵干.

drying on cement drying plots:

Sun drying of unhusked rice is made on the straw-mat on the ground; accordingly, it is not needed to dry unhusked rice on cement drying plots.

drying establishment and rice drier:

rice (unhusked rice) drier:

kansoki 乾燥器, *neppu kansoki* 熱風乾燥器 (Japanese)

Unhusked rice is dried by hot, dry air blown by electric power. The prevalence of this unhusked rice conditioning has facilitated construction of a "small Japanese style garden" in almost all farmers' grounds. Thus, changes in landscape of farm houses and atmosphere of farm villages are really striking.

storage in rice granary:

komegura chozo 米倉貯蔵 (Japanese)

Sixty kg. of husked rice is packed in a straw bag and stored in rice granary and/or in store rooms. The rice granary was also a status symbol, too.

rice storage hut:

On isolated islands a rice storage hut stands separated from a dwelling house. *Ashiage gura* 足揚倉 on the Hachijo Island and

takakura 高倉 on the Amami Islands there are huts on piles that are similar to pictures of houses drawn in clay images in ancient times of Japan. The term “*ashiage*” may remind one of *ashi hitotsu agari no miya* (means a shrine, the floor of which is feet high) which appeared in the *kojiki*, the oldest collection of myths. The fact that the Indian term “*gura*” for a storage hut is same with the Japanese term “*gura*” for a storage hut may be worthwhile to study.

hulling:

momisuri 粃摺 (Japanese)

to lang 土籠 (M.Chinese)

(1) punding wooden mortar

tsuki usu 搗臼 (Japanese)

(2) clay hand-mill

hiki usu 碾臼 (Japanese)

This clay hand-mill was brought from mainland China in 1624 and its efficiency was three times as big as the wooden mortar. However, it was not economical because of the fact that rice was liable to be broken into pieces. Because of this a small scale peasants continued to use traditional wooden mortar. There were two kinds of clay hand-mills: pulling and pushing by one man and by two men. This clay hand-mill is called *yousu* 夜臼 (night mortar), as the hulling was previously practised at night.

(3) rice-hulling machine by an animal: This was used only by wealthy farmers for some years after the World War I.

(4) rice-hulling machine by engine: This has been widely used co-operatively since the World War II.

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rice-mill, milling by machine, mill:

rice-mill:

seimaisho 精米所 (Japanese)

nen mi kon chan 碾米工廠 (M.Chinese)

rice-polishing:

seimai 精米 (Japanese)

nen mi 碾米 (M.Chinese)

Rice-polishing was practised by wooden pestle and millstone, which was usually established in each farm household. Water-mills, which became popular in the 1880's, were serviceable for beating barley rather than rice. However, farmers came to polish rice in a water-mill after about 1930. Since World War II, milling by machine has become common all over Japan.

R.5.3. Supplementary elements:

(Watching and resting) hut in rice field:

nogoya 野小屋 (Japanese)

liau 寮 (M.Chinese)

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Note (PS,)

(1) It is interesting that residual rice straw has recently been burnt with the application of combines. (Written in November 1992)

要 旨

日本では米ならびに稲作関係用語は豊富であるが、麦作ならびに牧畜用語は貧弱である。稲作は日本農業の根幹たるのみならず日本人の生活のバックボーンをなすものである。

最近20年間、農業技術・耕作体系に大きな進歩があった。なにより大きな変革は1968年以来減産、減作に迫られ、米作中心の日本農業の仕組に批判が加えられつつある。そして、昔からの稲作関係用語、農耕儀礼も失われつつある。本論はヘラルド・ウーリッヒ教授の『米作の術語』を参照することによって、世界的展望の下に日本の稲作用語を検討し、米作文化に新しい光をあてようとするものである。

本報告は三つの意義を持つ。第1は日本稲作用語を地理学の観点に立って、世界の農業システム・土地利用の立場から、確定・組織化したという点である。そして日本語術語に的確な英（米）語を提示し、さらに中国語を初めとしその他アジア諸言語をも関連的に付している。第2は本研究を地理学用語委員会で発表（ドイツのギーゼン、1970）したのは20年以上昔のことであるが、それまでの重要術語を採り上げ、日本稲作文化の基本的なもの、歴史地理的なものは十分論ぜられている。本論を利用することによって四半世紀間の日本農業の激変を、より深くよりグローバルに考察することができる。第3は日本稲作・米作文化の日英二ヶ国語による専門用語（論）集としては最初のもものと自負するものである。そして筆者の *A Bilingual Cross-Cultural Lexicon for Area Studies* (in prep.) (『地域研究のための二ヶ国語による通文化レキシコン』、刊行準備中) へと展開する。