The *jōri* Plan in Ancient and Medieval Japan

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The process of the completion, change and breakdown of the *jōri* plan and its function in ancient and medieval Japan are analyzed and explained comprehensively in this paper.

The *jōri* plan was completed by the application of the *jōri* indication system to the *jōri* grid pattern in the middle of the 8th century. It is thought that the completion of the *jōri* plan was closely connected with new land laws in 723 and 743 which permitted private land ownership. The *jōri* plan must have been effective for registry affairs which rapidly increased as a result of those laws. The *jōri* plan was not imported directly from China with the *Ritsuryō* system, nor did it exist as a completed system with the enforcement of the *Handen-shūju*.

We cannot find such a systematic and mechanical place indication system with ordinal numbers as the *jōri* indication system in *T'ang* China. The *jōri* plan was gradually completed and developed according to Japanese conditions in and after the 8th century.

The indication system of capital cities of Japan also developed in nearly the same way.

The *jōri* plan was depicted clearly and used formally on *Handen-zu* which were the basic rural plans of ancient Japan. There must have been two types of such rural plans. One was drawn as a linear arrangement of *ri*, and the other depicted each *ri* separately. We can find 3 groups of representation method originating from both types.

The *jōri* plan was still effective for bureaucratic procedures as the basic unit of formal permission and various rights or duties after the breakdown of the system of *Handen-shūju* in medieval times. Especially the function of the *tsubo* section was very active as the basic unit. Accordingly, the *jōri* grid pattern has become a principal element of the traditional Japanese rural landscape.

The unit of *ri* was not so important as that of the *tsubo*, but sometimes the medieval estates or villages adopted the boundaries of *ri* as their own. The *jōri* plan functioned till the 16th century in the regions where it was well-established, but we can find some errors on the maps due to the lack of information or necessity in medieval times.

The typical indication system progressively changed in accordance with completion, fixation and breakdown of the *jōri* plan as follows: At first, an ancient place name was divided or revised to fit the *jōri* grid pattern. Then the *jōri* indication system was used with the ancient small place name. Before long the *jōri* indication system was used independently. After that the small place name was used side by side with the *jōri* indication system. Finally the small place name became to be used independently at the latest by the end of 16th century.

This stage is basically the same as the present method. Each stage of indication system correspond with each stage of social and economical condition of Japanese history. It indicates at the same time changing points or changing processes of the Japanese rural landscape. The *jōri* plan is a very important and effective key on the historical-geographical research of Japan.

I. Introduction

*jōri* (条里) grid patterns are dominant on the alluvial plains in the Kinki district, along the Setouchi coast and northern Kyushu, which have all been densely populated since ancient times. Typical *jōri* grid patterns are shown in Figure 1. They are characterized by an interlacing network of paths and ditches, which divide a given area into units measuring approximately 109 meters square, and each of the unit sections is subdivided regularly into 10 allotments. The density of distribution of the *jōri* grid pattern decreases according to the distance from these ancient core areas. In

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Figure 1. An aerial photograph of typical jōri grid pattern in 1961 (A), and restored jōri indication system of the same area in Yamato Basin (B).
the areas where the distribution of the jōri grid patterns is not dominant, it often appears as small fragments. The jōri grid pattern itself also has been distorted. Thus the distribution of the jōri grid pattern is not uniform, but it is found almost everywhere throughout Japan. The northern limit of distribution reaches the suburbs of present Akita City in the Tohoku district (TORAO, 1960), and south to the Kokubu Plain of Kagoshima Prefecture in the Kyushu Island (YONEKURA, 1957, TAMURA, 1970).

Each jōri grid pattern has individual characteristics related to its formation and maintenance, the complicated processes of which must be considered after further accumulation of data, including those obtained from archeological excavations. However the origin of the jōri grid pattern generally goes back to the Ritsuryō (令制) period (from the latter half of the 7th century to the 10th century) of ancient Japan. The existence of the jōri grid pattern is certain by the 8th century at the latest.

The land planning in the Ritsuryō period of Japan was characterized by grid patterns such as the jōri grid pattern and the grid street patterns of capital cities. A uniform system of place indication by numbering was also the most characteristic element of this land planning. These have been major research subjects on the history and historical geography.

The 'jōri plan' means the system which existed or should have existed in ancient and medieval Japan. It consisted of the jōri grid pattern and the jōri indication system (KINDA, 1985, 10–14). The jōri indication system had some local varieties of terminology and areas of the system, but generally the basic unit was called a tsubo 見 which was 1 chō 町, about 109 meters in rural areas) square, and 6 chō square was called a ri 里), which accordingly consisted of 36 tsubo or 654 meters square. The typical indication system is as follows: Each tsubo was numbered from 1 to 36 in each ri, and each ri also was numbered generally in each jō (条) which was a linear arrangement of ri, but sometimes each ri had an individual name such as in Yamashiro Province. This jōri indication system was generally arranged uniformly in each gun 郡, county). An example of this system’s use would be: "Yamato-no-kuni (国, province), Yamabe-gun, 7 jō, 3 ri, 24 tsubo", which indicated a place’s location precisely and systematically.

Various patterns of the place indication systems are found in old maps and historical documents of ancient and medieval Japan. Through analysis and arrangement of these materials, the formative processes of the jōri indication system can be demonstrated. At the same time, it can be proved that the jōri plan was not introduced as a complete system, but gradually came to completion. The major parts of the jōri plan were well fixed and functional, but after that some parts were maintained and others transformed or broken down.

In this paper, the processes of the formation, function, processes and stages of transformation, as well as the breakdown of the jōri plan will be surveyed and demonstrated. Moreover, other facts which relate to the jōri plan must be discussed at the same time. This is because the jōri grid pattern has become a very important element of typical traditional rural landscape. In particular this paper will focus

Figure 2. Part of a map of an estate of Gufukuji Temple in 735.
on how the jōri plan was expressed on old maps in ancient and medieval Japan.

II. The process of formation and establishment of the jōri plan

1. The process of completion of the jōri plan

Among the existing old maps of rural plans, the earliest one is of an estate of Gufukuji Temple in the County of Yamada, the Province of Sanuki shown in Figure 2 which was drawn in 735 A.D. (DNKH Vol. 2, pp. 44-50). This map was drawn on paper and represents grid patterns of one chō. In each grid, a kind of small place name, the acreage of the temple's property and the yield are generally written, 5 chō east and west in width, but no jōri indication system is written. This type of small place name was not generally used after the establishment of the jōri indication system as will be explained later, so we refer to it as an 'ancient' small place name. Accordingly the farmland was laid out as a unit of a one chō square grid, or in other words the jōri grid pattern must have existed and the ancient small place name was used for place indication.
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The documents of Hōryūji Temple in 757 show the same conditions. The property of Hōryūji Temple was indicated also by ancient small place names in the County of Utari of the same province. This form shows the same indication style which was used on the above-mentioned oldest map. At that time, the Jōri indication system had not been introduced in this region.

On the other hand, the property of Gufukuji Temple in the County of Yamada of the same province was written as “8 jō 9 ri 31 Ikeda 1 tan (1 tan (仏)≈0.12 hectares) 180 bu (1 bu (仏)≈3.3 square meters)” on a document in 763 (DNKH, Vol. 5, pp. 460–461). The jō and the ri are the terms of Jōri indication system and Ikeda is the ancient small place name. So this shows that the place indication was done both by the Jōri indication system and by the ancient small place name. As a result it is clear that the Jōri plan was completed by the introduction of the Jōri indication system from 757 to 763 in Sanuki Province (KINDA, 1982).

In other provinces the earliest documents, on which the Jōri indication system are written, were found in Yamashiro Province in 743 and in Iga Province in 748, both earlier than in Sanuki Province.

Seventeen old maps called the Tōdaiji Kaiden-zu (東大寺開田図) drawn on hempen cloth between 751 and 767 are stored at Shōsōin of Tōdaiji Temple (DNKI, Series 18, Vol. 4). These maps depict a one cho grid pattern, the Jōri indication system, the ancient small place names and acreages of the temple's properties in each grid as shown in Figure 3. Accordingly the Jōri plan was completed by this time in Omi, Echizen and Etchū Provinces, some parts of which were shown on these maps. Three old paper or hempen maps of these areas, not owned by Tōdaiji, show the same conditions.

However, the two old maps which show some parts of Settsu Province are slightly different from the above-mentioned Tōdaiji Kaiden-zu. In the case of the map of Minase no sho (DNKI, Series 18, Vol. 2, pp. 348–349) in 756, a one cho grid pattern and the ancient small place name in each grid are drawn, but no Jōri indication system is written as on the map of an estate of Gufukuji Temple. Furthermore on the old map of Ina sho drawn

Figure 4. Part of a map of Ina sho.

This original was depicted in 756.
in the same year (DNKI, Series 18, Vol. 4), the jōri indication system is included. In this case the jōri indication number was written at the center of each grid as shown in Figure 4, different from the Tōdaiji Kaiden-zu in Figure 3. The ancient small place name and the acreage of the temple's property are written on the northeastern corner of each grid, nearly in the same form as Figure 3. Unfortunately this map is a hand written copy of the original one, so we cannot draw any final conclusions. But it is quite possible that the ancient small place name and the acreage of the temple's property were original descriptions, and the jōri indication number was added later. We can understand that the jōri indication system was introduced in Settsu Province in 756 or shortly thereafter.

The same processes can be found in Awa Province. The old map of Daizudokoro in the County of Nakata (DNKI, Series 18, Vol. 2, pp. 270-271), which is considered to have been drawn between 749 and 758, depicts only one chō grid pattern and land use, but not the ancient place name. However, the old map of Niijima no sho in the same county (DNKI, Series 18, Vol. 2, pp. 270-271), which was drawn in 758, depicts the one chō grid pattern and the ancient small place names and the jōri indication system. In this case it is also possible that the jōri indication system was not used for original description. So the jōri plan was completed in Awa Province between 749 and 758 with the introduction of the jōri indication system.

In this way the jōri plan was completed in the middle of the 8th Century in many provinces one after another (Kinda, 1982). Before the introduction of the jōri indication system, the ancient small place names were used for place indication as already mentioned. In case of the County of Utari, Sanuki Province, the ancient small place names “Kami (Upper) Harada”, “Naka (Middle) Harada”, and “Tsugi (Next) Harada” are found (Kishi, 1955). It is thought that the original place name “Harada” was divided into three or more parts to fit with the jōri grid pattern. Such cases are found in so many other provinces that this process can be generalized (Kinda, 1982).

This type of ancient small place names made by the division of the former place names is considered to have existed widely in the region where the jōri grid pattern is dominant today, but the ancient place names were rarely divided in the regions where only small fragments of the jōri grid pattern are scattered or where the patterns cannot be found. In the Kinki district, the greater part of such place names already fitted the jōri grid pattern but others fitted only partially in accordance with the density of the distribution of arable land (Kinda, 1982).

Accordingly, the typical process of the formation of the jōri plan had two stages as follows:

- The introduction of the jōri grid pattern to rural areas and the division or the revision of the ancient place names to fit it.
- The utilization of the jōri indication system with the ancient small place names as already mentioned in the example of the County of Yamada, Sanuki Province in 763.

By the enforcement and the fixation of the jōri plan the ancient small place name gradually disappeared as place indication and only the jōri indication system was used. This stage can be designated as 6. Stage 6 will be explained in Section IV-1.

2. The origin of the jōri indication system and the process of its establishment

The basic law of ancient Japan was the Ritsuryō code, such as the Taiho Ritsuryō (大宝律令) which was enforced in 702. The Japanese Ritsuryō code is well known to have been based on the Chinese codes of the Sui (隋) and the T'ang (唐) Periods. The origin of the jōri plan was also thought to have been imported from China at the same time, because it was considered to be a very important part of the Ritsuryō system. But, as we have shown the jōri plan was completed in the middle of the 8th century, more than a half century later than the enforcement of Ritsuryō code. That is to say, the jōri plan was not an original part of Ritsuryō code and its origin should be considered separately.

It is certain that various grid patterns
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Figure 5. Outline of plans of Heijo-kyō and Fujiwara-kyō. These plans are restored by KISHI (1969). But indication systems are amended by the present writer.

existed in China (SUZU, 1963). Accordingly the grid pattern of the \textit{jōri} plan has something in common with the Chinese case basically, but the direct model of the indication system of the \textit{jōri} plan has not yet been found (KINDA, 1983).

The place indication systems of China in the T'ang Period are known by documents found in Dunhuang and Turfan; many fields were generally indicated by administrative units such as xian (県), xiang (郷) and li (里) or by the proper names of cun (村) or qu (渠). Their boundaries were indicated by showing land marks of the cardinal directions. In many cases, in addition, the direction and the distance from \textit{zhouxiangcheng} (州県城, the prefectural palace) or other places were written. In such cities as \textit{ducheng} (都城, the capital) or \textit{zhouxiangcheng}, places were indicated by \textit{fang} (坊), each of which had its proper name. Furthermore within \textit{fang} the direction from \textit{jiao} (角) or \textit{yu} (隅, corner), \textit{men} (門, gate) and \textit{shizijie} (十字街, cross-road) showed the location.

The Japanese case is different (KINDA, 1983). The systematic indication system of capital cities seems to have been formed a little earlier than the \textit{jōri} indication system. In Fujiwara-kyō (藤原京, the capital 694–710) there were \textit{8 bo} (坊) in the east and west and 12 \textit{bo} in the north and south as shown in Figure 5. Each \textit{bo} (about 265 meters square) had particular place names, but in Heijō-kyō (平城京, 710–784, mainly) which was much bigger as shown in Figure 5, the systematic indication system by numbering was introduced. Each \textit{bo} (about 530 meters square) was standardized with numbers by 723 at the latest. One \textit{bo} contained 16 \textit{tsubo} (each \textit{tsubo} was about 1.2 times wider than the \textit{tsubo} of the \textit{jōri} plan), which were numbered from 1 to 16. The first document which showed the numbers of \textit{tsubo} was found in Heijō-kyō dating from 747. Later in Nagaoka-kyō (長岡京, 784–794) and Heian-kyō (平安京, 794–, continued as Kyoto) the unification of the systematic indication system was more fully advanced. The term \textit{tsubo} from Heijō-kyō was replaced with \textit{chō}, which was subdivided into 32 allotments. The position of each allotment was, further, indicated systematically with ordinal numbers.

Some documents show that the basic section of the \textit{jōri} plan was called \textit{bo} in the latter half of the 8th century, when the term of \textit{tsubo} was used in Heijō-kyō. But the name of \textit{bo} of the \textit{jōri} plan was replaced with \textit{tsubo} by 800, when \textit{tsubo} of the city plan was replaced with \textit{chō} in Heian-kyō. After this, numbers from 1 to 36 in each \textit{ri} of the \textit{jōri} plan were used with \textit{tsubo} as shown in the Introduction. In this case the former small place name which was attached to the number of the \textit{jōri} indication system was no longer used.

In this way, the place indication systems which were so mechanically standardized were not implemented exactly as they had been in China, but were developed according to Japanese conditions since the 8th century.

The next Section will take up the background of the necessity and opportunity of the introduction of the \textit{jōri} plan, whose function
must also be explained.

III. The function of the jōri plan and its change

1. The function of the tsubo section of the jōri plan

The system of Handen-shūju (班田収授) was a very important part of the Japanese Ritsuryō. Handen-shūju laid down a grant of 2 tan fields (about 0.24 hectares) to each man who was older than 6 years and two-thirds of that to each woman, generally from the end of the 7th century at the latest. The jōri plan was considered to have been introduced for the enforcement of the system of Handen-shūju (Hotta, 1901), but this idea must be corrected because of the gap of the introductions of both systems as already explained. The jōri grid pattern, whose basic section consisted of 10 tan must have been undoubtedly convenient for making grants, but Handen-shūju was carried out without the jōri indication system before the middle of the 8th century, when the jōri plan was completed.

Taihōryō, which was the basic law and contained the law of Handen-shūju, showed that each grant had to be registered with acreage and boundaries, and did not make mention of any systematic indication system. In fact only the ancient small place names were used by the middle of the 8th century, as already pointed out, and so they must have been used for Handen-shūju, too. It is thought that this method was not so accurate for indicating the grant but it was not impossible to carry out Handen-shūju itself. This method was similar to that used in T'ang China and it is supposed to have been imported and used from the latter half of the 7th century to the middle of the 8th century. This method may have sometimes caused confusion, but these problems were not so serious, because all land belonged to the state under the original system of Ritsuryō.

In the meantime a new land law called Sansei-isshin-hō (三世一身法) was enforced, which permitted private ownership of newly cultivated paddies after 723. A newly cultivated paddy irrigated by an existing canal or pond was to be owned by the cultivator, and one irrigated by a new canal to three generations of the cultivator's family. Therefore, it became necessary to make a clear distinction between public lands and private lands. Moreover another land law called Konden-einen-shizai-hō (兼田永年私財法) was enforced in 743. This law permitted perpetual private ownership. Under these laws newly cultivated paddies and private lands to be cultivated increased rapidly, and the distinction between public lands and private lands became much more important and indispensable. The work of the bureaucracy increased and became so much complicated that a systematic indication system had to be introduced. This jōri indication system must have been effective for the purposes of registry affairs. This history of land policy and the function of the jōri indication system is coincident with the process of the formation of the jōri plan, as was shown in the previous chapter. Kishi (1959) thought that the maps for Handen-shūju called Handen-zu (班田図) were first prepared from about 742. Yoshida (1983, pp. 264-265) considered that Konden-einen-shizai-hō was formed by means of intensification of the bureaucratic land controlling system and that the dominion over land was strengthened by this law. Both of these considerations support the argument of this paper. It was also found that specialists for surveying and mapping participated in making maps for Handen-shūju (Kameda, 1958). The specialists signed the maps with the governor of the province and the owner of the estate. These maps played an active role in land policy.

The jōri plan was still effective for the bureaucracy after the breakdown of the system of Handen-shūju at the beginning of the 10th century (Kinda, 1982). The maps for Handen-shūju also continued to be effective for registry affairs. An owner of the estate who had formal permission issued by the Ritsuryō state would apply for renewal of permission to the governor of the province. The jōri indication system was used for listing the land of estates on this application form. The governor stamped the application after the examination (Sakamoto, 1961). In these bureaucratic procedures, maps called Kuni-su (国図, the
base map which was used at the office of the province) or Minbushō-zu (民間省図, at the Department of Civil Affairs) which were inherited from Handen-zu, were used for base maps, and the tsubo section of the jōri plan was the basic unit for approval and permission. The specialists were also engaged in the procedure of reading these maps (Kimata, 1981). All bureaucratic procedure was based on the tsubo unit of the jōri plan, and clearly noted by the jōri indication system. In this period it is evident that the use of the jōri plan had not diminished, but was maintained or even increased (Kinda, 1985, pp. 126-136).

The tsubo unit of the jōri plan was at the same time the basic unit of various rights or duties. Requisition and taxation were based on the tsubo unit, and were applied to all men who owned land or rights for cultivation of the tsubo from the middle of the 11th century to the middle of the 13th century.

Permission for reclamation used to be issued on each tsubo unit, and be rescinded after 3 years if the land was not cultivated. The tax on newly reclaimed land was to be paid to the State. But at the end of the 9th and the beginning of the 10th century this system was slightly changed. The tax on newly reclaimed land was paid to either the State or the owner of the estate, who already had the rights to the tsubo. The owner of the estate could easily expand his rights to the whole area of a tsubo where he had already received rights. The tsubo of the jōri plan, in this way, was a very important geographical unit (Kinda, 1985, pp. 126-136). Accordingly the tsubo unit of the jōri grid pattern was maintained throughout medieval times.

On the contrary the ri of the jōri plan was merely the unit of the jōri indication system. The next section will focus on the ri unit.

2. The ri of the Jōri plan and its representation on old maps

The jōri plans are drawn variously on old maps which were made from the 8th century to the 16th century. There are at least 5 patterns of representation of the jōri plan as follows:

1) The boundary line of the ri is the same as that of the tsubo . . . . 34 maps.
2) The boundary of the ri is stressed more clearly than that of the tsubo . . . . 16 maps.
3) Each ri is separately depicted . . . . 2 examples (each of them consists of many maps).
4) The boundary of the ri is depicted but that of the tsubo is not . . . . 5 maps.
5) Allotments inside of the tsubo are drawn . . . . 4 maps.

Besides the above-mentioned patterns there are 10 maps without the jōri indication, two of which (DNKH, Vol. 2, pp. 44-50, DNKI, Series 18, Vol. 2, pp. 270-271) show the stage before the completion of the jōri plan, and eight of which (NSS, Nos. 51, 64, 100, 101, new 13, new 26, new 50, and new 81) show the stage after the breakdown of the jōri plan.

Three maps of the fifth group belong to the first or the second group at the same time. The maps of the fourth group must have been only used for indices of the location of the ri. Therefore the difference among the groups from the first to the third may be concerned with the function of the jōri plan, but not necessarily the fourth and fifth groups.

The patterns of representation of the first group such as seen in Figure 3 include about 60% of old maps which express the jōri plan. Especially all the maps which were depicted in the 8th century belong to the first group, except for only one example (Figure 6, NSS, No. 25) which belongs to the second group. It is quite understandable that the boundary line of the ri was depicted as the same as that of the tsubo, because the ri was originally arranged as a larger unit of the jōri indication system, and it was possible that the ri did not have any other function.

The map of Naruto in the County of Imizu, Etchū Province in 767 (DNKI, Series 18, Vol. 4, No. 18), which belongs to the first group has an error in mapping (Iyana, et al., 1958). One of the linear arrangements of ri called jō was shifted by a span of one ri on this map. This error is considered to have occurred to the map which was copied from the Handen-zu,
Figure 6. A map of Gakuanji Temple and surrounding area in the latter half of the 8th century.
because the *Handen-zu* must have been made as a long map of each *jō* (Kishii, 1959).

By contrast, the 16 maps of the second group can be divided into two sub-groups (2a, 2b).

2a) The boundary of the *ri* was stressed as a bold line . . . . 10 maps.10)

2b) The boundary of the *ri* was stressed by a double line . . . . 6 maps.11)

A map of the 2b group (NSS, No. 94) depicts only the east-west boundaries of the *ri* as double lines. There are 2 maps which draw the same estate, one of them has bold lines and the other has double lines (NSS, No. 74). In this case the two kinds of lines have the same meaning. These stressed lines do not mean directly that the unit of *ri* had a stronger function than being mere units of indication. The boundary of the *ri* of the jōri grid pattern on the land was a path or ditch, and was the same in size as that of the *tsubo*.

However, we should focus on the 2 maps which belong to the 2b group. One of them
is shown in Figure 6 (NSS, No. 25), which depicts Gakuanji Temple and surrounding areas in the Yamato Basin in the latter half of the 8th century. The other is shown in Figure 7 (NSS, No. 28) which copies the outline of Keihoku Handen-zu in the suburbs of the Heijo-kyō in the 8th century. Both of them depict each ri independently. In this case the name of the ri is written on the outside of the ri. These examples suggest the possibility that there were two types of original Handen-zu. Besides the type which was drawn as a linear arrangement of ri as already explained, there was another type which arranged each ri separately. Each ri was connected to one another in the former type, but not in the latter.

This consideration is supported by the existence of maps of the third group which draw each ri separately. It is considered (Kishii, 1959, Miyamoto, 1959) that maps of the Saga Estate (KUM, Vol. 3, No. 27) in the northwest corner of the Kyoto Basin copied the outline of Handen-zu of the County of Kadono, Yamashiro Province, in 828. These maps consist of 9 separate ri of the jori plan, and the attached documents suggest that each ri was drawn separately. As these examples show, the jori plan was recorded on Handen-zu as a linear or separate arrangement of ri, and the two types of Handen-zu influenced later maps. The important function of the tsubo of the jori plan was explained already in Section III-1. The ri was scarcely important except in its function as the larger unit for the indication system. In the case of the Tōdaiji Kaiden-zu in the 8th century, only one estate, called Hasetsukabe in Etchū Province (DNKI, Series 18, Vol. 4, No. 12), is considered to have been established or regularized by ri boundaries but the other 14 estates did not. Generally speaking, the unit of ri was not so important as that of tsubo. But in medieval times there appeared estates which were rearranged and regularized by the unit of ri. At that time the jori plan itself was in the process of change or breakdown.

IV. The process of change and breakdown of the jori plan

1. The breakdown of the jori indication system and the formation of the small place names

The typical process of the formation of the jori plan had three stages (stages (a), (b), and (c)) as already explained in Chapter II. After the completion and the establishment of the jori plan, it was customary to indicate the place by the jori indication system (stage (c)). While the basic unit of the jori indication system was the tsubo, which at the same time was the basic unit of the jori grid pattern, there was not so systematic indication system for the allotments inside the tsubo. When it was necessary to indicate the location inside the tsubo, the owner or the natural features of each direction of the allotment was shown. But the location of the allotments began to be indicated by small place names after the 10th or the 11th century. Each of them was generally used to indicate an allotment or a part of the tsubo. But some small place names which corresponded to the tsubo section appeared about the 11th or the 12th century and soon became popular. At this time these small place names were generally used side by side with the jori indication system. This condition can be classified as (d).

Stage (d) seems to resemble stage (b), but is different. At stage (b) the ancient type of small place name was attached to the jori indication system, but at stage (a) both the small place name and the jori indication system were used independently side by side with each other. The small place name of stage (a) was not equal to the ancient one and almost all of them were new names as will be explained later.

Sooner or later, as the utilization of the jori indication system decreased, another way of indication increased, which was using the small place name without the jori indication system. This new stage can be classified as (e). Stage (d) changed into (e) in early medieval times, when the jori plan was not fully fixed, but stage (a) continued till the end of medieval, when it was fixed completely such as in the Yamato and Yamashiro Provinces.
this way, the shift to stage ⑩ was completed by the beginning of the 17th century at the latest. Many old maps on which the jōri plan was drawn were made and used in medieval times, where stage ⑩ continued for a long time. In other words, the jōri plan was kept in use. Both the jōri indication and the small place names were written on the old maps of Otogi Estate in 1265 (NSS, No. 44), Yokota Estate in 1306 (NSS, No. new 11), Wakatsuki Estate in 1307 (NSS, No. 58), Izumo Estate in ca. 1473 (NSS, No. 96) and Kudara Estate from the latter half of the 14th to the former half of the 16th century (NSS, No. 71) in Yamato Province, Niho Estate (NSS, No. 94) in Ōmi Province and a part of the county of Otokuni (NSS, No. new 96) in Yamashiro Province.

These small place names on the old maps include those originating in the jōri indication system such as ichi-no-tsubo and ni-no-tsubo. Some of the terms of the jōri indication system changed into small place names and were fixed in medieval times. By contrast, at some estates similar terms to those used in the jōri indication system were used as a kind of small place name in the same period as follows: The grid patterns on the old maps of Ikaruga Estate in 1329 (NSS, No. 64) in Harima Province and Hattori gō (original in 1298, NSS, No. 51) in Bitchū Province were very similar to the jōri plan but their indication methods were an imitation of the jōri plan in medieval times. Some documents of Yano Estate (THM, No. Te 8) in Harima Province, Ōta Estate (HEI, Nos. 3223, 3224) in Bingo Province, Ōyama Estate (HEI, No. 1489) in Tamba Province, Katori Estate (HEI, No. 3223) in Shimousa and Mibu Estate (HEI, No. Ho 359) in Aki Province also show similar small place names from the 12th to the 13th century (Ueshima, 1970, Hattori, 1973, Kinda, 1982).

The jōri plan was in the process of breakdown in medieval times, but the jōri grid pattern was maintained as the basic unit of the small place names, the irrigation system, the boundaries of the rural community and so on, which were inherited from the function of the tsubo as explained in Section III-1. The jōri grid pattern which exists now as shown in Figure 1 has been preserved as the result of such a process of change.

2. The perception of the jōri plan and rural communities in medieval Japan

The outline of the jōri plan in the northern part of the Yamashiro Basin is shown in Figure 8 (Kinda, 1984) where the jōri plan was fixed entirely and continued its function until the end of medieval times. In case of Yamashiro Province each ri of the jōri plan had an individual name, and the jō were numbered from south to north in the Counties of Otagi, Kii and Otokuni, and from west to east in the County of Kadono. The jōri plan covered the area of Nagaoka-kyō (784–794), so the jōri plan proved to be re-enforced after the abandonment of Nagaoka-kyō. In the area of Heian-kyō (794–) the jōri plan existed at least partly (Fukuyama, 1938), but disappeared due to the construction of Heian-kyō.

This jōri plan continued to be used till medieval times as already mentioned. Figure
Figure 9. *Kujō-goryō-henzu*, showing the plan of Heian-kyō and the location of *ri* in the County of Kii, Yamashiro Province.

This map was presumed to have been made at the beginning of the 16th century as an index map of the location of the *ri*. This map shows the jōri plan and the plan of Heian-kyō at the same time, so the perception of the relation of both plans is shown vividly. Figure 10 shows the difference or the gap between this map and the real pattern. This map represents the comparatively exact relation of both plans, but the gap becomes greater in the western part of this map than in the eastern part. The reasons or the factors for this inaccuracy can be pointed out as follows:

1. In the eastern part of this map both of the plans were well fixed and many of the grid patterns were maintained as shown on Figure 10.
2. By contrast, in the western part of this map, the fixation of the jōri grid pattern was imperfect because of natural features and floods. Besides the southwestern part of Heian-kyō already had gone to ruin in late ancient times, so almost all grid patterns disappeared (KINDA, 1978b).
3. In the eastern part of this map there were many lands which belonged to the Kujō Family, who made and used this map, so the family must have requested more information on the eastern part, and not on the western part.

Other similar examples are found. The
The Jōri Plan in Ancient and Medieval Japan

Figure 10. Gap between the real grid patterns and its representation in Kujō-goryō-henzu (straight lines).


Maps of Izumo Estate in 1473 (NSS, No. 96) and Yanagimoto Estate in 1485 (NSS, No. 72) in Yamato Province include errors in depicting and explaining the location of the ri (Kinda, in press). In this way, even in Yamashiro and Yamato Provinces where the jōri plan was well fixed and used for a long time, errors occurred because of the breakdown or deterioration of the function of the jōri plan and the lack of information in late medieval times. In those cases it can be said that the jōri plan functioned for more than 700 years since the middle of the 8th century. But the function or the utilization of the jōri plan was not the same even in places of the same province or region.

Each ri of the jōri plan in Yamashiro Province had an individual name as shown in Figure 8. The name and the unit of the ri was strictly used all the time apart from the names of the estate, the rural community and the village, till the end of medieval times.

By contrast quite a different process was found in Hizen Province. The name of the ri was used in the same way as the village, and the boundary of the ri was often used as that of the village or the rural community. These different examples show clearly that the ri sometimes became the unit of the rural community when it took on another function or was strengthened as the unit of some activity in spite of having been the mere unit of the jōri indication system originally. Both cases can be found everywhere the jōri grid pattern exists (Kinda, 1984).

Figure 11 shows both cases on the same plain. The boundary of ōaza (the rural community whose boundary was generally arranged at the latter half of the 19th century but tended to succeed the unit and the boundary of the traditional rural community) which coincides with the jōri grid pattern was drawn on this map. The total length of this boundary is 4,224.0 cho (about 460 kilometers). The jōri grid pattern as shown in Figure 1 was found everywhere on the alluvial plain of Yamato Basin, and the distribution of the boundaries of ōaza in Figure 11 is nearly the same (these distribution patterns are shown simply in Figure 12A). The boundary of 918.5 cho
Figure 11. Boundaries of rural communities, which coincide with the jōri grid pattern.

(21.7%) of the above-mentioned 4224.6 chō coincides with the boundary of the ri. The distribution pattern of this is shown in Figure 12B, and is recognized as a very random one, which is quite different from Figure 12A. Accordingly, the boundary of the ri of the jōri plan was used sometimes as that of the rural community, and sometimes not. The black dots in Figure 12B point out the locations of the medieval estates much of whose boundary was based on that of the ri. It becomes evident that these dots are distributed on parts of high ratio meshes of Figure 12B. In consequence, the main factors concerning whether the boundary of the ri coincided with that of rural community or not can be found in the process of the formation of the estate or the rural community in medieval times (KINDA, 1984). Therefore it is thought that the perception of the jōri plan must have had a very strong influence on this process.
V. The jōri plan and the traditional rural landscape in Japan

This paper showed the process of the completion, the fixation, the change and the breakdown of the jōri plan. At the same time we also classified the formation of the small place names and the relation between the jōri plan and the boundaries or the units of the rural communities. These are very important elements of the rural landscape and its transformation, but the other elements such as settlement and land utilization have not yet been discussed. These problems are explained briefly in this chapter.

On the alluvial plains in the Kinki district where the jōri grid pattern is dominant, the typical settlement type is a very compact nucleated settlement. And the most popular land utilization consists of paddies inside the jōri grid pattern. These three elements are so closely connected to each other that all of them were considered to originate in the ancient Ritsuryō period (Yonekura, 1932, 1933). But it has since been proved that both the settlement type and the land utilization were quite different from the present landscape. The settlement type in ancient and medieval Japan was as follows (Kinda, 1971, 1985, pp. 339–443): Many old documents for trading land properties record the location of housing lots, buildings and land marks of the four directions of the lots. Some old documents for examining estates or such old maps also record settlements. Much data from recent archeological excavations also provide some information about settlement types in ancient and medieval times. These examples show that there were scattered homesteads and small hamlets ordinarily in the Kinki district and nucleated villages were not found in ancient times, i.e., in and after the 8th century. But some villages began to form from the 11th century, and the formation of the nucleated settlement became a very wide spread phenomenon in medieval times. As a result of such processes, very compact nucleated settlements were dominant till the end of the 16th century. Some strong influences on this transformation were the strengthening of control by the...
owners of estates in early medieval times and the social confusion due to war disturbances in late medieval times.

At the same time, land utilization was also changed. There were still many dry fields and waste lands included in the jōri grid pattern in ancient times. The dry fields were generally less productive and less valuable than the paddies, and the area of paddies in ancient times was itself unstable because of the shortage of irrigation water or other disasters, etc. In other words, many parts of farm lands were abandoned for cultivation or harvest out of necessity once a few years or more.

Such extensive land utilization was improved gradually during medieval times by the digging of new canals or the building of new irrigation ponds. New systems for controlling irrigation were established in various regions at the same period. The cultivation or the development of waste land was also very actively carried out in medieval times. Accordingly land utilization became more and more intensive, and the area of cultivated land expanded in this period (Kinda, 1978a, 1985, pp. 241-338).

These significant changes of the settlement type and land utilization were carried out within the jōri grid pattern. Various functions of the jōri plan and their transformation explained in this paper were closely connected with these processes.

The typical process of the formation and transformation of rural landscape is shown in Figure 13 as a conclusion.

Figure 13. Typical process of the formation and transformation of rural landscape in the area where jōri grid patterns are dominant.

Notes

1) The details of the research history of the jōri plan was arranged by Hattori (1893, pp. 10-75), and problems were pointed out by the present writer (Kinda, 1985, pp. 4-42).

2) Abbreviations

<table>
<thead>
<tr>
<th>No.</th>
<th>Document or map number in each historiography or collection of materials.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNKH</td>
<td>Dai-Nihon Komonjo (Historical Documents of Japan) Hennin (chronicled), University of Tokyo Press, Tokyo.</td>
</tr>
<tr>
<td>DNKI</td>
<td>Dai-Nihon Komonjo (Historical Documents of Japan) Iewake (editions in each owner of documents), University of Tokyo Press, Tokyo.</td>
</tr>
<tr>
<td>KAI</td>
<td>Takeuchi, R. (ed.), Kamakura Ibun (Historical documents of the Kamakura Period), Tokyodo-Shuppan, Tokyo.</td>
</tr>
<tr>
<td>NSS</td>
<td>Nishoka, T. (ed.), Nihon Shōen Ezu</td>
</tr>
</tbody>
</table>
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Shūsui (Collection of the Old Maps of Estates in Japan), Tokyodo-Shuppan, Tokyo.

KUM Kujōhe Monjo (Historical Documents of the Kujō Family), Meiji-Shoin, Tokyo.

THM Tōji Hyakugō Monjo (Historical Documents of Tōji Temple).

3) This document was found and reported by Kishii (1955).

4) Almost all of the photographs of old maps are contained in DNKH, DNKI and NSS. NSS is especially convenient in looking at them, but more than half of the photographs of 224 maps in NSS are those of handwritten copies. The present writer examined many original maps, and photographs of Figures 6 and 7 are also taken from original ones. Each old map is indicated by the document number of NSS in this paper for convenience’s sake.


6) These maps are further divided into two subgroups (2a, 2b), which are shown on notes 10) and 11).

7) Saga-no-shō Zu (Maps of Saga Estate, NSS, No. 27) consists of 9 ri which are depicted on 10 sheets of paper. Yamashiro-no-huni Ku-gun sato- tsuke-cho (Maps of the County of Kui in Yamashiro Province with the jōri plan, KUM, Vol. 3, No. 825) contains 17 ri which are depicted on put 1 sheets of paper.

8) NSS, Nos. 37, 63, 91, new 75, and KUM, No. 652.

9) NSS, Nos. 44, 65, new 10 and new 11.

10) NSS, Nos. 62, 74(A), 89, 90, 96, new 11, new 32, new 65, new 72 and new 85.

11) NSS, Nos. 25, 28, 71, 74(B), 94 and new 7.

12) At the first part of the first volume of Handen-zu of the County of Kadono in Yamashiro Province, there is a description that is read as follows (Kishi, 1959): “Sōri 5 (total numbers of ri are 5) Oguranishi ga ri, Ogura ga ri, Yashiro ga ri, Ichiharanishi ga ri, Oi ga ri (one of Tōji Temple’s documents)” It is thought that this pattern of the description was suitable for the maps on which each ri was depicted separately.

13) A similar map has been already reported (Kinda, 1985, p. 157), but Figure 6 includes some new information and is the newest result.

References


古代・中世の日本における条里プラン

中世に至るまで重要な役割を果し続けた、とくに京の区画が果した意義は大きく、これが今日まで広範囲にわたって条里地割を存続させ、村落表景の基盤となっている大きな理由である。

これに対して、里の区画方は条里呼称の単位として以上の機能を本来は有していなかったが、荘園あるいは村の境界として使用された場合であった。

条里プランは、定着度の高い地域では16世紀まで機能し続けたが、中世には必要性や情報量の減少によって、絵図類などの表現にさまざまな間違を生じていることもあった。

以上のよう条里プランの完成・定着・崩壊のプロセスとともに、土地表示法は典型的には、古代的地名の条里地割に対応する分割ないし再編、条里呼称法と古代の小字地名の併用、条里呼称法のみによる表示、条里呼称法と小字地名の併用、といったプロセスをたどり、遅くとも16世紀末までに、現状のように小字地名のみによる表示法へと変化した。これらの各段階は歴史的な社会的・経済的段階に対応するものであり、同時に日本の村落表景の形成プロセスないし直間にかかわるものである。条里プランは、日本の歴史地理研究において、重要かつ有効な手がかりとなるものである。

条里プランの完成・変容・崩壊のプロセスやその古代・中世における機能について、絵図類における表現に注目しつつ、包括的な検討を進めた。

条里プランは、8世紀の中頃に、すでに存在していた条里地割に加えて条里呼称法が導入されることによって完成した。これは、三世一法と豊田永年私財法の下での私領の増加と、それに伴う土地の記録・確認作業の急増に対応するものであったと考えられる。従って、条里プランは律令と共に中国から直接輸入されたもので、班田取授の開始と共に完成した形で存在したものであった。また、唐代中国の一般的な土地表示法とも異なっており、古代日本の実情に合わせて次第に完成度を高めていったものであり、この点では都域プランにおける土地表示法と同一軌道上にあった。

このような条里プランは、一圏一覧として作製された班田図に明示されて使用されたが、これは条ごとに里を連続して描いたもので、条ごとではあっても、里を一つ一つ個別に描いたものがあったと考えられる。現在する絵図類には、この双方の様式を反映したもので確認することができる。

このような条里プランは、班田制崩壊後もさまざまな土地関係の許可あるいは権利・義務などの単位として、