島根大農研報 (Bull. Fac. Agr. Shimane Univ.) 18 : 206—213, 1984

天竜林業の展開過程

北川　泉

Process of Development of the Tenryu Forestry

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1. Outline of the district

The Tenryu forestry district in general includes the main stream of the Tenryu river, it's tributaries as the Atago river, the Futamata, the Keta, the Ohchitose and the Misakubo, and the upper stream of the Ohta river. As an administrative district, it has one city, five towns and one village: Tenryu city, Sakuma town, Haruno, Mori, Misakubo and Inasa, and Tatsuyama village (see Figure 1).

While the total area is 119,924 ha, occupying 15.4% in Shizuoka Prefecture, the population is 85,623 (estimated in 1983), occupying only 2.4% in the prefecture. 71% of the total area is occupied by woodland, and the agricultural land is only about 4% of the area.

As for industry, since the district is characterized by the Tenryu Forestry, it's the forestry and the forest product industry that have been mainly developed. Besides these, the tea cultivation is prosperous, too.

2. Improvement of the Tenryu Forestry

The Tenryu forestry district shows remarkably high level both in the rate of artificial forest and in the growing stock per ha. As for the rate of artificial forest, the Tenryu district has attained 78.5% almost twice as the national average 42%, and as to growing stock per ha, it shows much higher level as 129.4 m^3 than the national average 78.4 m^3.

Furthermore, concerning the composition of forest age class, 44% of the Tenryu district is occupied by the class over 31 years, while the national average of private forest shows that the area under 10 years is 31%, 10-15 years is 21%, 15-25 years 30% and over 25 years 18%. (Table 1, Figure 2).

The large propotion of the old forest in the Tenryu district relies on the result that the artificial afforestation has been developed earlier than the national level. This can be also pointed out as the high rate of reafforestation in the Tenryu district: the value of the district is 59.9%, over twice as that of the national, in the average value during 29 years, from 1954 to 1982. Though the recent nationwide state of private forest has been yet on the stage of making forest resource, the silviculture activity in the Tenryu district is principally the afforestation combined with timber production (see Figure 3). From such view points mentioned above, the Tenryu artificial forestry is far more suc-

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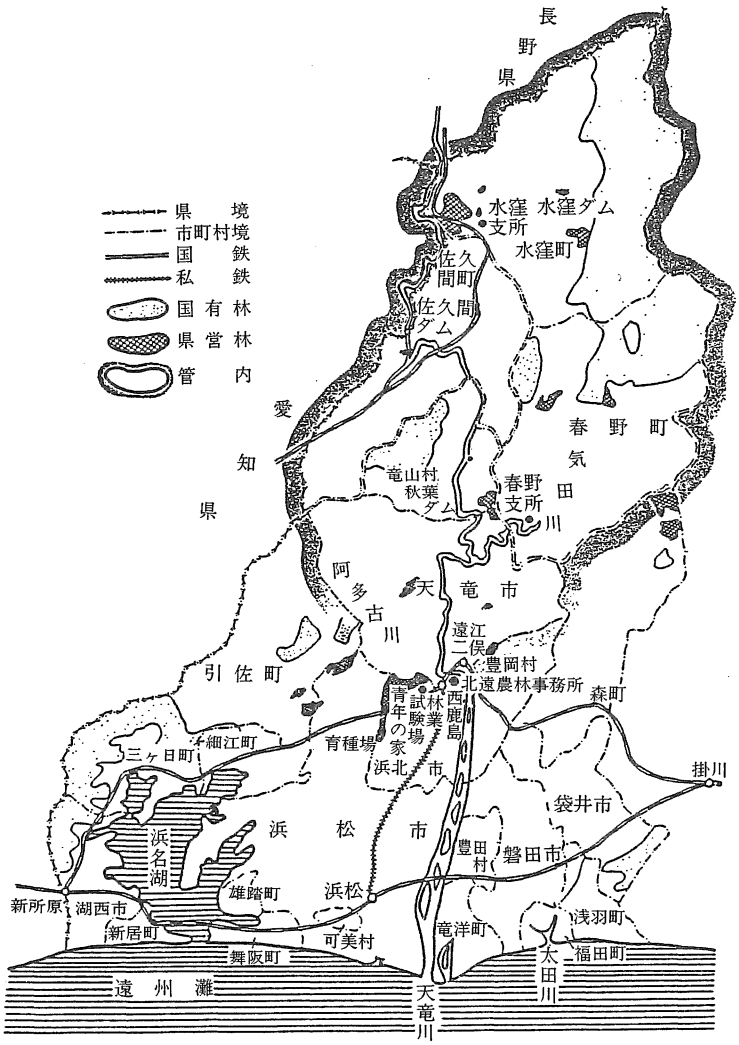


Fig. 1 Hokuen Area

Table. 1 Rate of artificial plantation to total area of private forest and their age structure

	Forest area	Rate of plantation	<10 (years)	11-20	21-30	30<	Total
The whole country	16,532,681(ha)	43.9(%)	25.1	39.1	21.6	14.3	100.0(%)
Tenryu region	85,099	78.5	8.0	21.1	26.7	44.2	100.0
Tenryu	14,891	82.6	7.1	18.1	28.0	46.8	100.0
Misakubo	15,174	69.2	9.7	25.6	22.4	42.3	100.0
Sakuma	15,231	85.3	8.1	19.9	25.2	46.8	100.0
Tatsuyama	5,282	92.0	5.6	21.9	23.6	48.9	100.0
Haruno	17,346	81.2	8.3	21.5	24.7	45.5	100.0
Mori	9,401	76.1	6.3	19.5	32.9	41.3	100.0
Inasa	7,773	63.4	9.1	20.7	34.3	35.9	100.0

The data of the whole country was quoted from "World Agriculture & Forestry Census, 1980", Tenryu region and each towns and villages, quated "Private forest in Shizuoka Prefec. 1983 Tenryu forestry region"

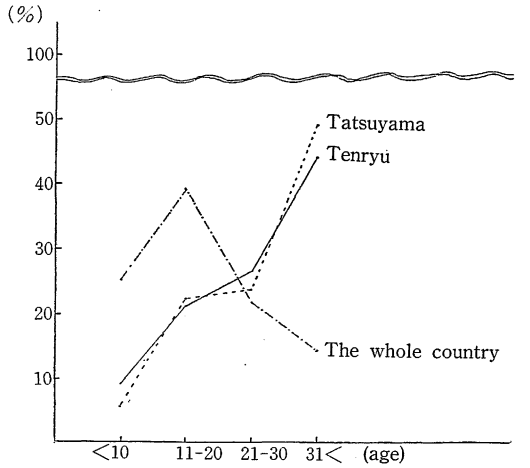


Fig. 2　Rate of artificial plantation to total area of private forest and their age structure

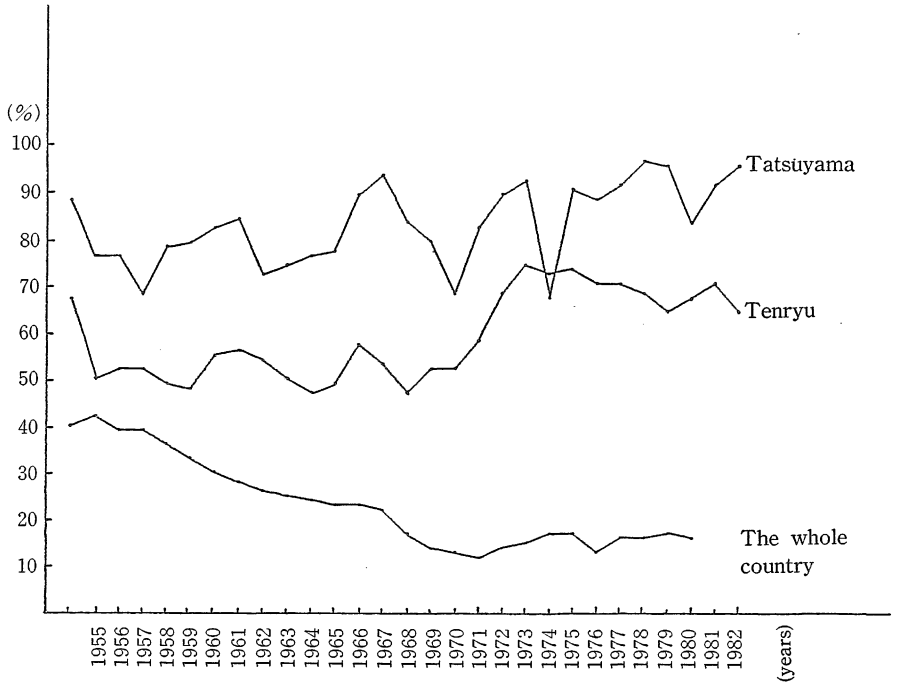


Fig. 3　Percent of reforestation to total planting

cessful than the national level.

3. Shifting cultivation forestry to have supported the Tenryu torestry

As Noboru Matsushima states, "It is no exageration to say that the establishment of Tenryu artificial forestry is based on the method of shifting cultivation reforestation (taungya). It's because the shifting cultivation method was used for the agriculture es-

sential in this district, in the period from the middle of Meiji era to Taisho era (1890's-1920's) when the extensive artificial reforestation." (N. Matsushima, 'Immature of Advanced Forestry the fact on technology of Tenryu forestry.)

From a point of the real state of land use, certainly, it is obvious that the Tenryu district has been the shifting cultivation zone, too. This is shown in Table 2 and 3, according to the analysis by N. Matsushima ; at Okuyama village in Tenryu, there overwhelmingly remained the land to be object of the shifting cultivation, namely 'burning, even in Taisho era (1912-1925). Moreover, the survey in 1935 by Forest Service of the Ministry of Agriculture and Forestry, says that the shifting cultivation had been executed by 42.9% at Misakubo town, 11.4% Josei town and 8.1% Tatsuyama town of the farmhouses in this district.

The combination of such shifting cultivation work and artificial reforestation comes to be 'Yamazukuri-ringyo' which has developed the artificial forestry in the Tenryu district. As a matter of fact, the improvement of the artificial forestry was not always so smooth, but it could 'kill two birds with one stone' because the shifting cultivation work,

Table. 2 Changes in land use (Okuyama village)

Years	Paddy	Cultivated land	Shifting cultivation
1887	50.6(ha)	795.6(ha)	9,999.7(ha)
1892	52.6	797.4	10,002.7
1897	53.5	797.4	10,003.0
1902	37.3	548.6	8,378.9
1907	33.2	543.1	8,382.6
1912	33.9	529.3	8,393.5
1917	36.0	496.3	7,807.9
1921	37.3	477.0	7,828.3
1926	37.4	427.8	—
1930	—	—	—
1935	33.5	286.3	—

Kaneiwa, Y. "History of Development of Tenryu Forestry", 1965.

Table. 3 Areas of shifting cultivation and numbers of farmer's family

	1935			1950		
	Area	A	B	Area	A	B
Tatsuyama	7(ha)	59	8.1(%)	0.00(ha)	0	0.0(%)
Yamaka	8	36	5.6	0.88	1	0.3
Jyosei	12	40	11.4	0.33	1	0.3
Misakubo	80	384	42.9	0.33	9	1.0
Keta	2	15	1.9	0.13	2	0.3
Tatsukawa	—	—	—	1.48	29	6.7
Total	109	534	15.7	2.05	42	1.3

A: Numbers of family that carry on shifting cultivation
B: Rate of "A" to total farmer's family
Data, The Ministry of Agriculture and Forestry, "The Investigative Report on Shifting cultivation and KRIKAEBATA",1935, "World Agriculture & Forestry Census, 1950"

which enables forest farmers to produce on forest land, is to be land preparation, and brush cutting in the forestry.

We should remember, however, that it was the shifting cultivation which used to play the main role at least in Meiji era (1868-1911), and that the silviculture was rather on the regulated situation. In other words, it was 'Yamazukuri ringyo' that has established new cultivation composition by combining Sugi and Hinoki with the shifting cultivation work which is specialized by the complex management to have organized various products. (Note: see p. 169 op. cit.)

And yet, 'Survey Report on Forestry Management in the Tenryu basin (June, 1938)' published by All Japan Federation of Forest Association says, "In the case of cutting natural forest, reputed to be 'new hills'shinyama, and of planting Sugi and Hinoki on the cleared area, the shifting cultivation has been customarily executed since long before, by cutting small trees and burning them down to bring land under cultivation, to plant directly seedling of Sugi and in the meantime, the intermediate culture was also executed such as wheat for the first year, barn millet and soybean for the second and potatoes for the third. The shifting cultivation had been executed so often in those days, because of the merit to simplify cultivation and to remove weeding of much trouble, and of the effect to add food on the hills without large farms. On the contrary, the shifting cultivation is said to have the demerits to waste components in the soil and to do harm to the growth of standing trees. Nowadays the execution is diminishing and its district is regulated to be only a part of Misakubo town and Josie village, too. The cause does not always rely on simply the real state mentioned above. It seems to be reasonable to consider the development of forestry economy and the improvement in the level of people's living." (quoted from p. 67-68)

4. Return to pure forest and Mono-culture

Since Showa era (1926-), the shifting cultivation in the Tenryu district has been drastically diminished. According to the survey by the Forest Service, though the propotion of 'Yamazukuri ringyo' in the silviculture are in 1935 was considerably large as 31% of Misakubo town and 29% of Josei village, Tatsuyama village (5%) and Yamaka village (7 %) should only small propotion.

This means that the shifting cultivation has been rapidly diminishing since Showa era (1926-), which caused the reduction of 'Yamazukuri ringyo' depending on the shifting cultivation. As the result, the forestry independent of the shifting cultivation weeding, turned to be remarked as a unique work in forestry. (see note)

Note: N. Matsushima regards the independence of weeding work, which doesn't associate with the shifting cultivation, as 'weeding forestry'. (see p. 184 op. cit.)

Such proceeding of pure forestry has improved the increase of the planting trees, and come to indicate the direction of generalization of thinning, mainly because of the disappearance of the competitive condition between pure forest and shifting cultivation products.

Matsushima states that the number of planting trees has showed gradual increase since around 1955, to be about 3,600 trees per ha since 1962. Especially, Tatsuyama village, the center of the Tenryu forestry, has 500 trees per ha more than the average in the Tenryu district.

This pure forest method was, in a sence, the process of separation of farmers in the district from agricultural production, too. Though some labor was associated for just tea cultivation mostly it was separated from the production, and because of this, forest owners could not but make use of employed labor.

The number of recent forest owners categolized by the scale of owned forest is shown in Table 4. Compared with the average in Shizuoka Prefecture, there have been a number of owners with small and petty scale, though its scale has become larger to a certain degree.

It is the village headmen in the past who had organized the labor supplied by forest owners with small scale. Since 1955, the village headmen themselves had by degree come to be organized into labor groups of forest cooperation. The state in the organization of labor groups by forestry cooperation is shown in Table 5. In the organization, the Tatsuyama village forestry cooperation played the leading role, which has been entrusted with 400-500 ha of weeding works a year since 1964 when the organization of work groups got on the right track.

72% of membership in the work groups belongs to long term work as over and above 210 days, and many of the workers are specialized in forestry labor. Because they are the workers who have been separated from the production of agriculture and forestry, the volume of succeeding works in a year need to be kept in order to insure the labor.

Shown in Figure 4, reporting the recent actual results of silviculture, with the decrease in cut volume, the planted area has been diminishing drastically.

And besides, shown in Figure 5, the work condition in district is to be so called mono-culture without any works but tea cultivation, except for the forestry.

For the future, the stable maintenance of forestry production and the constant employment for workers will need to form the new organization of production and the industrial structure with strata by compounding industries.

Table. 4 Forest owners categolized by the scale of owned forest

ha		<1	1-5	5-10	10-20	20-30	30-50	50-100	100<	Total
Hokuen	Numbers of family	1,411	1,204	375	298	91	127	82	41	3,629
	Rate (%)	38.9	33.2	10.3	8.3	2.5	3.5	2.3	1.1	100
Shizuoka	Numbers of family	31,878	16,804	3,407	2,008	625	526	317	169	55,734
Prefecture	Rate (%)	57.2	30.2	6.1	3.6	1.1	0.9	0.6	0.3	100

Data, 1980 World Agriculture and Forestry Census

Table. 5 Outline of forestry labor at District Forestry Cooperation level

Name of Forest Cooperation	Numbers of working group	Numbers of workers	Numbers of workers according to days worked					Numbers of workers according to their ages				
			<60	60-89	90-149	150-209	210<	<20	20-39	40-49	50-59	60<
Haruno	22	82	7	3	10	20	42	—	8	19	41	14
Misakubo	19	111	6	5	11	24	65	—	13	28	34	36
Sakuma	14	84	—	1	9	19	55	—	7	23	36	18
Tatsuyama	16	123	4	—	11	20	88	1	33	37	39	13
Tenryu	24	90	10	4	9	40	27	1	16	24	30	19
Total	95	490	27	13	50	123	277	2	77	131	180	100

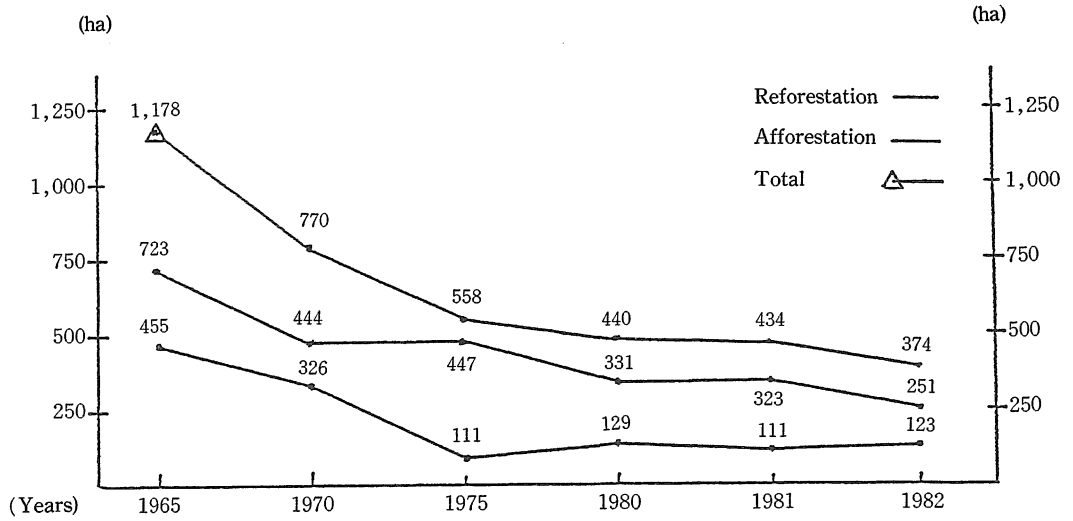


Fig. 4　Reforestation and afforestation

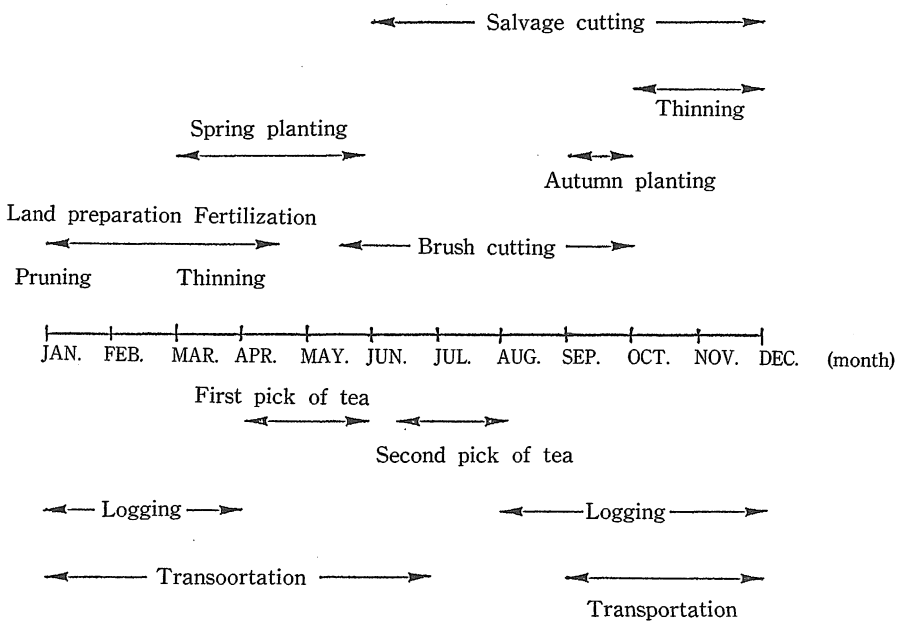
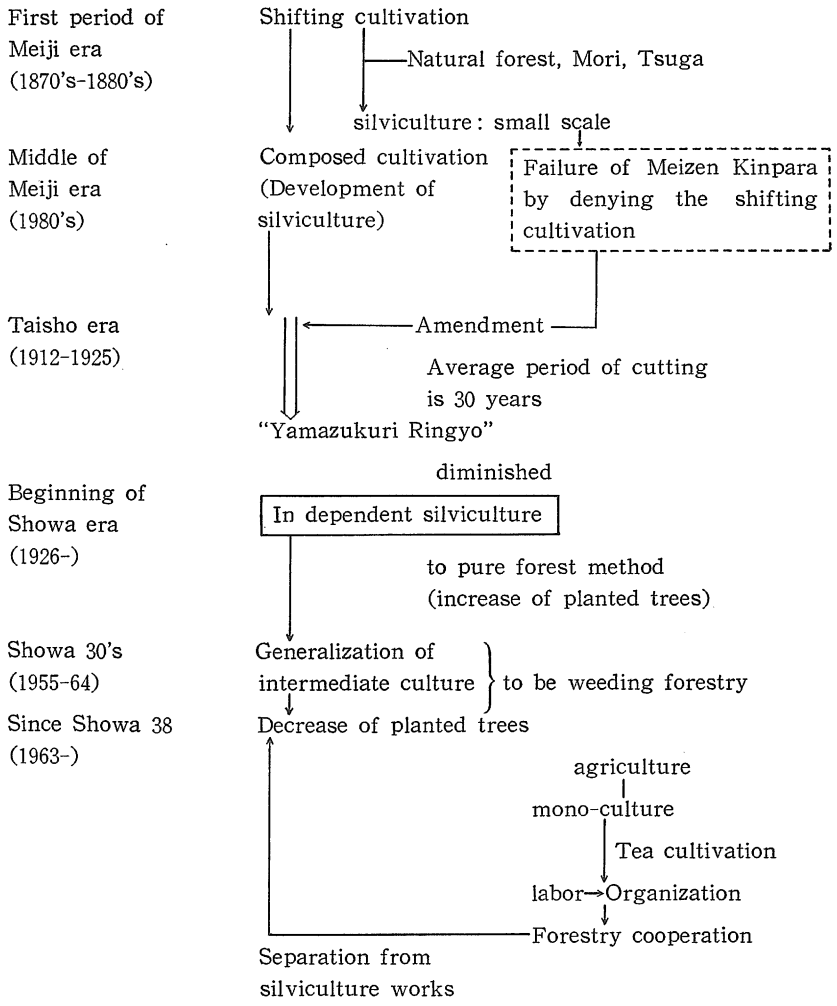


Fig. 5　Works at each month in Tatsuyama

(Diagram) Development of Tenryu Forestry



摘　　要

天竜林業の展開過程は，その造林地形成期においては，焼畑造林（山作り林業）として展開したといってよい．それは，耕作複合の一環として造林が進展していったことを意味する．

しかし，昭和に入り焼畑造林（山作り林業）の衰退とともに，独立の造林方式が徐々に確立し，純林方式に移行していった．この過程で植栽本数の増加をみたが，間伐の一般化とともに植栽本数の減少が進み，伐期も長期化の傾向をたどる．

純林・独立の造林方式は，労働力を育林労働と遊離させる方向をうながし，昭和30年代後半に至ると，労働力の組織化対策に迫られるようになる．森林組合による労働力の組織化がそれである．

今後，林業生産を安定的に維持し，労働力の安定就労を確保していくためには，新たな生産の複合，産業のコンプレックス化による複層産業構造（ポリカルチャー）をどう形成させるかにかかっているといえよう．