A Regional Geography of the Chikuhoku Region: Its Natural Environment and People’s Life

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Abstract: This report aims to make clear regional character of the Chikuhoku region by analysis of its historical, cultural, and physical environment aspects, because the environment in which we live is usually part natural and part human-made. So, the author has focused his attention on the process of development and transition of, transportation activity, land use of agricultural and other activity, and water resource and management activities, considering the effect of physical environment.

Distinctive features of the Chikuhoku region are, the first, location in the hilly land. The second, in any time of history this Chikuhoku region had and has been always favoured with high accessibility to the transportation artery. The third, because of its situations in the inland climate and hilly landform, water resource scarcity had and has been acute problem.

Key words: Hilly Landform, Small River System, Tiny Flat Land, Transportation, Halfway Location between Nagano and Matsumoto

I. Introduction

The ancient administrative division of Japan into some 60-odd provinces was largely established by the 6th or 7th century. For more than 1,000 years these provinces were maintained as the basic divisions of the country. Shinano Province, province represents Kuni, and those province were usually had been subdivided more small units, most of them are corresponding Koori or Gun (County), that were well coincide with physical geography units, especially in case of Shinano Province, where high, steep mountains and deep valleys were made clearly barrier among subdivided small provinces.

The Chiku-hoku Region, 'Chiku' is abbreviation of Chikuma and means an administrative unit of County or Gun, 'hoku' represents situation in the northern portion, is the research object of this report. The author is aiming to understand this region through researching and by analysis of the interactions of various facts between physical environment and people's life and culture, landuse transition and transportation development, adding various historical events. All of them reflect various interactions of mutual physical and human activities. Among them the most fundamental fact is that this region is situated on the hilly landform area. Small river system in the region had created several tiny basins along the streams by erosion actions during the late Pleistocene and Holocene in the hilly land. For peoples of far ancient days to penetrate into and to settle
in this region was more easier rather than areas were surrounded by more steep and more higher mountains. Those settled in this region had developed various resources for their life.

Peoples communicated with other regions had developed transportation route by way of those tiny basins. The communications had established fixed course which later on designated relay station system by the central government, ancient Imperial Court. It can be said that peoples of this region had and has enjoyed easy access to nation's political, cultural center such as Kyoto and Tokyo. From the ancient till the recent days, the center of Japanese culture and administration was traditionally situated in the Kinki district. The Imperial Court of old days had set several road as the trunk line, connecting the political and administrative center with the local districts, of which most important one and passed through Shinano Province was the Tosandou.

This Chikuhoku region has been able to take advantage of, Trunk road under the relay station system and under the post town system each of Middle and Pre-Modern ages, railway and expressway of Modern Times. Thus, introduction of advanced culture was not difficult and peoples of this region has enjoyed easy access to Nation's capital and influenced from the political, administrative center such as Kyoto and Tokyo.

The existence of several old aged temples and shrines probably show the evidence that, between this far distant region and the national capital, the political, administrative center, cultural exchange and various communications were intensive and intimate relations had been established from the ancient times. It might be also true that introduction of advanced culture were secured by the established transportation networks (長野県高等学校歴史研究会, 1994).

This region is composed of four villages locating from the east-west aligned direction as Sakai, Omi, Sakakita and Honjou. Total dwellers of this region accounts to approximately 10 thousands, 0.5 per cent of the whole Nagano Prefecture, and total regional areas exhibits 133.9 square kilo meters representing 1 per cent of the whole Nagano. Next Fig. 1 shows the outline of the discussed area.

II. Physical Environment

In this section physical environment is examined from the following three aspects; distinctive inland climate with short rainfall, peoples effort for water resource development to overcome water deficits, and characteristic hilly landform. All of them are derived from the fact that, this Chikuhoku region is situated on the inland hilly landform area.

II – 1 Distinctive Inland Climate

The climate of this region belongs to the distinctive type of the inland area, referred to the central inland climate, in where rainfall is relatively little and temperature have
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Fig. 1 Outline of Discussed Area
greater extremes between summer and winter.

The climate of this area is characterized by cold and dry winter, high temperature summer with small amounts of rainfall. Yearly rainy days are concentrated in summer Tsuyu and autumn Akisame including Typhoon season, the former occurs in late spring or early summer and the latter does in the early autumn.

In this region, annual precipitation is also quite variable, ranging between minimum 600 milli-meters and maximum 1,000 milli-meters. During the winter, snowfalls are little, and that is almost meaningless for water storage. Fair weather conditions usually prevail except during the Tsuyu and the Typhoon season. Rainfall occurs mainly between Jun and September. In summer, sometimes thundershower occurs bringing about substantial rainfall to supplement the water deficit and become only dependable water resource. People in this region welcomes this thundershower, although torrential rain often give rise to some flooding damges (坂北村誌編纂会, 1990).

Japan is tend to be understood as be blessed with abundant annual rainfall, but this is not true. People of this Chikuhoku region has often experienced short rainfall in summer season when the crop productions needed mass water supply.

In Japanese peoples traditional beliefs Kami were very concrete beings and specialized ability such as to protect people from disastrous floodings or severe drought and foods deficits. Monotheism had not developed in the traditional culture. Natural features such as mountains, forests and rocks were objects of worship called Kami. In this region, Mt Azumaya (1387 meters) with volcanic rocks stocks large amount of groundwater and has on its mountainfoot several springs and blessed water for the local peoples. So, in fact, Mt. Azumaya itself being a Kami.

Most of Japanese Kami (God) are being one of agricultural rituals to pray for bumper crops of rice. Numerous small shrines associated with local Kami worship were maintained throughout the country from the lowlands to the tops of the mountains. Among numerous such super power Kami, water blessing Kami imaged resembling figure of flying dragons are the most important. Peoples in this region has looked up the Mount Azumaya and prayed the super power dragon to make adequate rainfalls.

II - 2 - 1) Geology, Geomorphology and River System of the Chikuhoku Region

When we state about the relief of an area, we are stating about the hight and the shape of the land and whether it is flat or sloping. As with landforms in this region, Mt. Hijiri and Mt.Azumaya thrusts out and exhibits their huge rocky block features as the monadnock landforms, among the flat top surface hilly area, Saigawa Hilly Province. The Saigawa Hilly Province is one of the geologic and geomorphic province in the inland Central Japan. Mt. Hijiri and Mt. Azumaya are situated in the northern upland portion which are continuation of the Chikuma Mountainland extending from the volcanic chain of Mt. Yatsugatake and Mt. Kirigamine in the Central Shinshu. From the Chikuhoku Region the landform is shifted to the Saigawa Hilly Province.
The Saigawa Hilly Province are composed of following three flat-top surfaces of Diluvium, collectively named the Oomine-Surface group. They are, Nokkoshi, Nakajima and Ookura surface members. The first Nokkoshi is the oldest formed top flat surface and located highest altitudes ranging from 900 to 1,000 meters. The second member, Nakajima surface occupying middle heights from 700 to 800 meters. The lowest and the latest formed top flat surface is the Ookura surface ranging some above and below 600 meters heights (坂北村誌編纂会, 1990). The Saigawa Hilly Province is one of the geologic and geomorphic province in the Inland Central Japan. Saigawa Hilly Province is a member of the hilly relief groups represented in the 1 : 200,000 scale topographical map Takada, as the Higashikubiki Hilly Land and Uonuma Hilly Land.

Under more global scope on the topographical map, those hilly areas begin the extension from its northern tip in Akita Prefecture and lies along the Japan sea coast through Yamagata and Niigata Prefectures to the southwestern direction and eventually reaches in the northern portion of the Nagano Prefecture. Its topographical similarity is the hilly ones with gentle gradient surfaces and flat tops. It had geological origin of the Pliocene and the Plistocene sedimentary rocks. In this area it frequently landsliding activities occurs and the landscapes of rice terrace often can be seen. Saigawa Hilly province is located in the southwesternmost portion of this geomorphic unit extending northeast-southwest direction longitudinally. It is also coincidental with the “Green-Tuff” geologic zone.

Through this Chikuhoku region Chikuma Mountainland extends from north-south direction. Several small basins scattered throughout this mountainland. Those basins are divided from each other by mountain ridges part on which col landform are carved by erosion actions. Through depressed cols transportation routes has took place and become pass since ancient times. Those small basins has served as a corridor between two major basins and urban centers Nagano and Matumoto.

The regional highest peak Mt. Hijiri and Mt. Azumaya both being constituted of volcanic rocks and exhibiting monadnock features have only 1,400 meters hights and their valleys and rivers are neither deep nor long distance with only small amount of flowing waters. So groundwater storage capacity of those mountains are not so much as the larger ranges such as Hida, Kiso and Akaishi called Japan Alps. Only small amount of surface streams are available and people has been barely able to obtain enough water for their domestic and irrigation purposes by artificial way, construction of small size reservoirs. Water supply can hardly keep pace with the increase of consumption.

In this Chikuhoku region drainage basin are made up of following three streams, the main river Omi, the major one of 16kms length, Higashijou, the second large one, Bessho, the third and minor stream. Flowing into from the southern direction, the latter two are branch streams of the first one, Omi river. The main river Omi has its origin from the eastern slope of Mt. Azumaya, forming long and narrow shaped riverside lowland and
finally confluences into more larger Sai river. The Sai river is one of the major upper reaches of the River Shinano, that is the Japanese top scale ranked river.

On its both banks each of those rivers alluvial flat lowland filled with padi field extend. Paralleling them there are dilluvial upland. From the western tip end of the Omi river lowland toward the confluence point with more larger Sai river, the river Omi passes through the deep gorge, which is typical transverse valley approximately with length of 4 kilo meters. The gorge exhibits spectacular landscape for the tourist attraction and is called ‘Sashikiri-Kyo’, Japanese -kyo express deep and long gorge (田中・降旗, 1979).

II - 2 - 2 ) Stages of Water Resource Development and Management

The way peoples in this region obtaining potable water has experienced three evolution processes. The most early ones were directly get water from the springs or river surface streams. Places where unavailable to tap surface streams, well was developed and maintained from the Middle Age.

In the hydrological landforms adjacent to Aoyagi settlement, Tertiary sandstone layers of porous rocks are sloping from the mountain area toward and lie into underground at the habitation area. At the higher sloping portion sandstone rocks are exposed to the ground surface. From where rain water seepage into the sandstone, move slowly toward the habitation area, finally reserved and become potable groundwater through the infiltration process. People can tap this water for domestic use by digging well with 2 or 3 meters depths. On this hydrological base the local ruler of Aoyagi Clan collected his fiefs and constructed warriors dwelling zone at the end of the Middle Age. This settlement was soonly converted to the pre-Modern Age post stage town. This is the origin of Aoyagi settlement today.

In Chikuhoku region generally, it often can be found that settlements had been placed on or near the sandstone area. But digging well was technically and financially difficult task and limited persons had done and many others were to get water under the allowance of the well owners. In case of Aoyagi Post Town, near the ending of Edo Era, about 400 persons were depending on only 5 or 6 wells commonly used.

Till the early 1950s, such situations had continued with little changes. At the latter half of 1950s, in Sakakita village, several settlements had set sealed pipe supply system with electric motor basing on the community units. This is the second step ones. Waters were distributed for each household and hygiene level became more desirable. In this stage, only limited area could be supplied and stable distribution could not be realized because the sources of water were small and dispersedly located (坂北村誌編纂会・下巻, 1997). This was the pending subject what should to be soonly solved. In the final step, water obtaining, supplying and distributions had evolved from the one basing on each community units to the integrated system one basing on the whole municipal government
area. By this time, the village of Sakakita had assumed responsibility for providing the water supply. The water supply and distribution schemes finally established itself as the local government task, and realized at the early 1960s. This was attained at the western foothill of Mt. Azumaya of altitude 800 meters, by developing the new dependable supply source and by installing several distribution reservoirs.

Landform of the Chikuhoku region is hilly with gentle gradient, so, level and arable land are scarce. Being nestled within hilly land, agricultural area is small. In an effort to expand cultivation fields, hillside slopes had been terraced one by one since the Edo Era. It also can be found several irrigation reservoirs constructed on the mountain hillside dispersedly that is aiming to supplement water for short rainfall seasons. Despite the careful maintenance of the irrigation reservoir, serious water shortages would be result-ed when prolonged drought might occur. To insure an adequate supply of water, a large reservoir named Onikuma with capacity of 1,610,000 cubic meters are under construction. Adding to the agricultural purpose, reserved waters will be used for domestic purpose and will contribute to keep ordinary discharge of the river Higashijo. Dam construction be financed with national and prefectural government resulted in the integration of the water supply and distribution system apart from municipal amalgamations, and it will be the final stage of water development in this region.

III. Evolution and Transition of the Transportation in the Chikuhoku Region

III-1 Natural Environment and the Route of the Ancient Designated Road by the Imperial Court

Physical barriers or obstacles such as narrow river valley or steep mountain slope hinder people from meeting one another. But hilly landform makes those barriers less hard. As one traveler takes the route linked one basin to others by way of small passes, communication might be done more easily. There are several small basins in the Chikuhoku region, being aligned from the north to the south Omi, Nishijou, Midarehashi and Aida. Those basins are nestled within hilly landforms and are surrounded by gentle slopes. With minimum ups and downs those small basins had and has contributed historically the principal transportation routes to give excellent passage truck. It had and has been true from the ancient till recent days. The newest Nagano Expressway can pass through this region easily on the same reason (Fig.2, Fig.3 ).

Today this region is about the same distance from both the city of Nagano to the northeast and from the city of Matsumoto to the southwest, the former is the major and primary urban center and the latter is the second urban center in northern and central Nagano Prefecture.

Although today local people feel they live in far distant countryside because of isolated landscape appearance, their homland history shows that is false. Politically,
economically and culturally their homeland had and have actively interacted with other regions, above all, Kyoto. Existences of the shrines and temples and their long history exhibits well grounded facts of above communications. From the Ancient till the Middle Age, for the long times, the center of Japanese culture and administration was traditionally situated in the Kinki District. The Imperial Court of old days had set several road as the trunk line, connecting the political and administrative center with the local districts, of which most important one and passed through Shinano Province was the Tosando. At first, those networks were initiated by the order of the ancient Imperial Court. Local peoples had to be engaged in assisting the official travel of the government messengers.

Those transportation routes were also used for conveyance of the collected commodities and tributes as the tax paying for the central government. More later in the Middle Age, along with warrior class, those roads were used by some marchants and craftsmen for the purpose of trading. In the Pre-Modern Edo Era, post town system was firmly established. Commodity transportsations became very active and the masses began to made trip for pilgrimage or tourism, adding government officers and merchants. The 20th century were characterized as the innovative transportation age, those of railway service, automobile on the paved road and on the expressways.

Near the end of the Ancient Era, under the expansion of landholdings of elite nobles and large temples, the central government gradually lost control of the nation. Then local clans had already emerged in rural areas been forced to protect and to maintain their territory without depending on the authority of the central government. Thus the local clans voluntarily tributed some part of their territory as an offering to the powerful major nobles or the large temples to acquire the patronage of those elites. Local clans asked eagerly for those elites to allow building worship place to invite and receive the divided power and authority of the Ise Shirine, the most important symbol of the Yamato Clan. This was the background of the fact that Chikuhoku Region have some old-aged shrines as those Shinmeigu shrines of Miyamoto in Omi village and Kariyasawa in Sakakita village with its origin of 8th and 9th centuries (長野県地理学会, 2001).

III - 2 The Origin of the Post Town System and Trunk Road

During the Civil War Era each member of the feudal lord were independent from the Imperial Court authority. They must protect their own territory by accumulating military and economic power and preparing for getting over difficulty of troubles and struggles against with each others frequently occured.

During the Civil War Era, most of local feudal lords and warriors eagerly construct the castle towns. At first, warrior fiefs are ordered to inhabit collectively forming a sort of fortress on a designated tracts. To encourage and to promote economic activities, warriors required marchants and craftsmen to inhabit collectively some fixed place to operare their stable businesses and markets where were sequired by warriors military
power. Marchants and craftsmens were favoured with the increased business chances and transportational good locations and warriors had aimed and could expected expanded tax revenues. This was the origin of the Middle Age castle town. They had been built on the well considered planning base and were adopted to surrounding physical environments ingeniously.

Near the ending of the Civil War Era, some of those small castle towns were converted to post stage towns. Settlements of Omi, Aoyagi and Aida were typical ones experienced the same process and had gone under the similar situations. Under the Tokugawa clan sovereignty Civil War was ended and to unite the whole nation was realized. Major highways with post towns had been established firmly. Infrastructures were gradually improved. As the transportation of agricultural and other commodities expanded, the movement of people also increased. In Chikuhoku region some cash crops such as tobacco, hemp and kozo (Japanese paper materials), expanded its production on the upland field. During the days of stage town system, many horses were used for draft purpose and horseback unit cargo had important facility (篠本, 2001). The trunk road with its origin of the Ancient and the Middle Age Hokkoku Nishi Oukan (Trail) was the main transportation artery until the commencement of rail service at the beginning of the 20th century.

III - 3 Transportation of the Modern Era, the Days of Rail and Automobile

In comparison with the Pre-Modern Age, the progress and evolution of transportation was very rapid. The turning poit was the construction and commencement of the rail service.

Before the opening Nagano Bullet Train in 1997, there were two main railway lines passed through Nagano prefecture. One was the Shinetsu line, the another Chuou line. The Shinetsu line was the first mainland Honshu transverse primary line between Tokyo and Niigata, and completed in 1893. Chuou line was planned to take the route passing through longitudinally the Honshu inland area including Nagano. Aiming to supplement above two lines by linking them, the Shinonoi line was planned. Shinonoi line construction was completed in 1902, just the beginning of 20th Century. Since its beginning of the 1900s till the end of 1960s, for the local people the railway had been the only dependable function to carry mass of cargoes and passengers. Thus, this region was favoured with rail service from the beginning of the modern Railway Era. In Chikuhoku region it is worthy to notice that there was intimate relationship between coal mining prosperity and rail service operation. Coal mining and coal production for shipping in this region had experienced twice times of prosperous peak days. Both days the role of railway transportations were indispensable. The quality of coal of this region was not so high as compared with more larger scale Joban Coal field located near Tokyo, and unfavorable in price competition on the equal market condition. The first peak days were the time when the rail transportation service had commenced in 1902 between Shinonoi and Shiojiri via
Matsumoto. Major customers of coal were then newly arised silk reeling manufacturers in Matsumoto, Okaya and Suwa urban and industrial areas. At that time silk reeling manufacturers had been severely suffered from the deficit of woods for fuel purposes. They had eagerly required coal for fuels. Then, the rival Joban Coal could not access to silk reeling manufacturing areas of Shinshu because railway line from the Tokyo, Chuou Line, had not yet completed.

The second peak days were immediate after World War II., when war-defeated industry and citizens life had underwent very busy reconstruction processes. Great amount of coal were needed and Joban Area alone could not supply enough. This time had also been prosperous for the Chikuhoku region. Productions and shippings were busy during the full term of 1950s. Railway then was the only dependable transportation means to supply needed coal especially for Tokyo urban area.

In Nagano prefecture automobile transportation began its works from 1930s, and at first, its service areas were limited within and near some large urban areas. Japanese road traffics had been inconvenient and time consuming because of the poor road relating infrastructures, even in latter half of the 20th. Rail service had provided basic function and automobile transportation had facilitated partially and had only supplemental role. Automobile services had been depended on rail transportation. They had to start their services on distribution passenger and cargoes from the rail station to near and surrounding areas or, collect the passengers and cargoes from those areas to the rail stations. Thus, each rail stations showed a sort of transportation hub center. Recently long distance scheduled truck service are prevailing over, at one times this sort of long distant scheduled service were unrivaled by the rail service. During the High Growth Era, roads and highways are continuously being improved and constructed throughout the nation. Under such situation Nagano-Line of the Chuou Expressway, along with Omi I. C. and S. A., commenced its service from 1993（信州地理研究会, 1999）.

We can find the transformation of the Chikuhoku region represented in the different time topographical map, the year of 1959 (Fig. 2) and 1998 (Fig. 3), by comparing the two. The term from 1959 to 1998 is only short duration but arised regional transfiguration is to great degrees. The Chikuhoku region has experienced great appearance changing as with the various roads and, land use. Firstly, expressway opening has been the most important. Secondly, other road improvement widened with two ranes and paved surface, management class level up from the municipal to national and bypath opening included, has followed. In the year 1959 map, Hokkokunishi Oukan can be clearly seen but in the year 1998 map, we can barely trace its route. Rapid landuse evolution along the old day mainroad has resulted such situation（坂北村誌編纂会・別冊, 1997）.
IV. Land Use Transition of Agriculture and other Activities

IV-1 Landform and Agriculture

In this region almost padi fields are kept within the river flowing lowlands.

On the foothills of Mt. Hijiri and Mt. Azumaya, the lower slopes of those monadnock mountains has been used as upland fields, mulberry bushes, orchards and pasturelands. At one time in everywhere mulberry bushes were found. Hilly landform in this region with affluent sunshines favours various agricultural crops. In case of field crop such as hemp, surrounding mountainlands facilitate as windbreaks. Then this crop could be avoid to blown down by strong wind.

Livestock is raised on the gently sloped foothills of both Mt. Hijiri and Mt. Azumaya. In Chikuhoku region, raising cattle and horses has common in the mountains and uplands. Before agriculture became mechanized, raising cattle as draft animals was important. However, they are no longer necessary in the farming operation. Recent times Animal husbandry have become considerably less important.

This region had traditionally raised horses. The decline in the horse raising of 1960s has been derived from their replacement by dairy and beef cattle. But today dairy and beef cattle farming in this region is on a small scale and facing severe competition from abroad and other areas within the nation.

At one time the neighboring mountain foothill areas had abundant forest resources for building materials and for fuel purposes, along with charcoal production (笹本, 2001). Pine trees at one time had been the most common and valuable tree in this region. Pine tree, *Pinus densiflora*, the bark exhibits red colour, can survive in the environment of poor, even in no humid and thin soils. Today in Chikuhoku region pine forest in everywhere are let alone without intensive and careful trimmings.

Japan has been fast becoming an industrial and urban society with oil as the main source of power. Especially since the High Growth Era the oil became the major source of energy, and lumber came to be imported from foreign countries at a low price. Then forests are being devastated without sufficient thinning and lopping.

IV-2 Crop Variations

Among several crops rice growing has minor importance because most of the farmers grow it only for their own consumption. Other cereal field crops those of traditional wheat, buckwheat and soybeans are also for subsistence. Although farming exhibits subsistence character, several cash crops has been grown. Tobacco, hemp, kozo and lately added mulberry are examples of such cash crops.

Most of farmers in this region traditionally combined lowland rice cultivation and various upland field crops, most of them were cash crops, of which sericulture (mulberry) had formed an important part of the farmer's income before 1960s. Urban area have
Fig.2 Scale 1: 50,000 Topographical Map [SAKAKI] of 1959

4. Old Shrine Miyamoto Shinmeigu 5. Old Shrine Kariyasawa Shinmeigu
6. Shinonoi Railway(non-erectric) 7. Monadnock Mt. Azumaya
Fig. 3 Scale 1: 50,000 Topographical Map [SAKAKI] of 1998

Legend (Number): 1. JR Shinonoi Line (erectrized) 2. Chuou Expressway Nagano Line
3. Higashiya Setlement, Summer Vegetable Producton 4. Aoyagi Fortress Site
5. Housing Estate
grown rapidly during the High Growth Era, demands for truck-type farm products has been rapidly grown in place of previous grain crops such as soybeans and buckwheat and farmers have converted their products from dry upland crops to a combination of vegetables, fruits, flowers, tobacco, dairy cattle, hogs and poultry.

Mulberry fields were once prevalent in this region and its acreage was surpassed than any other crops from the rail service opening of 1900s till the end of 1960s. With the decline of sericulture and increased demand for planting trees purpose for private garden planting and public space green belt planting, nursery field of young trees have increased in place of former mulberry fields. After 1960s, another mulberry fields were converted to orchards.

Altitude temperature variation is large within the Chikuhoku region. Higashiyama settlement, Sakakita-mura, belongs to the cool upland climate. Immediately after World War II, to overcome food shortages and to encourage food supply, colonization and land reclamation was commenced to convert the former forest and grassland to arable land, at first. The food shortage was then the nationwide acute problem. Buckwheat, potatoes, and other serial crops were cultivated. Soon after 1950, in place of the former subsistence farming, commercial agriculture has developed by raising cool upland vegetables as summer cabbages and chinese cabbages.

Today, among several agricultural areas, we can find highly specialized and characteristic one in cool highland vegetable production area in Higashiyama, located on the higher western foothills of Mt. Azumaya, altitude of 900 meters. It originates the colonization aiming to bring the forest and grassland of commune under crop cultivation supported by the national and local government promotion policy immediately after World War II. In Higashiyama, along with cool upland vegetable production, some farmers are engaged in dairying. Manures of animals become useful organic fertilizers other than milk production.

During High Growth Era, the demand for cool highland vegetables increased rapidly. Vegetable growing on the slopes of Mt. Azumaya also expanded. Chinese cabbages, Cabbages, lettuce, carrots and yams are raised in the relatively cool mid summer when produce from other areas disappear from the large city markets (佐々木, 2001).

IV-3 Labour Saving and Part Time Farming

Recently, many of the tasks have been mechanized, and farming efficiency has also been increased by cooperative works.

Within the northern Shinshu district, in and around urban centers as Nagano and Matsumoto, industrialization and urbanization have created numerous employment opportunities which have attracted many rural people. And the majority of farmers has begun and been engaged in non-agricultural occupations by commuting. On the other hand, rice and some vegetables were tend to be produced for their own consumption rather than to sale. In spite of the fact that Japanese farming productivity is high due to
intensive operations in limited areas, labour productivity is low compared to the international standard. They cannot compete with inexpensive imports.

At first, immediately after the War II, to overcome the difficulty of serious food-shortage and in order to augmentation food production by farmers, land reclamation projects and plannings were actively promoted by the national and prefectural governments. Followingly, since the 1960s, to level-up the farming labour productivity became the main purpose of the land reclamations. This time the project has been focused on the program of adjusting the partitions of farmland was undertaken and promoted. With improvements of irrigation and drainage channels adding to realignment of fields, various agricultural mechanized implements labour saving purposes can be used. All of them were favourable for widespread using of agricultural machines. Thus increased mechanization in farming made rice farming less and less labour intensive. In case of rice cultivation labour savings, seedlings are first cooperatively worked in vinyl houses and make easy to use mechanized equipment in the transplantation works of each farmers.

Due to the large extent of labour saving, weekend farmworks and part time farming has become normal situation. Now every week days many farmers are commuting by trains and cars to the distant urban areas. Only in Sundays or holidays farmers are engaged in agricultural works in their croplands.

IV - 4 Land Use Transition

Establishments of branch factories made it possible to supply of labour from the farms within the same region. Those branch factories from the city of Nagano and town Sakaki, the latter is famous for its high-tech machine manufacturing, have employed above some three hundred persons most of them are farmer families women. And it has become a important source of farmer’s inome, along with in other areas commuting works.

Since the beginning of 1960s the tourism has spread over many parts of the Shinshu area, along with traditional skiing ground and hot springs. Omi-mura had developed small summer resort on the slope of the Mt. Hijiri, in collaboration with the prefectural government projects (坂北村誌編纂会, 1997).

That transportation and communications with the main Nagano and Matumoto urban areas and with many other areas including far distant large urban centers has been well developed would favour tourism in this region.

In Chikuhoku region tourism is expected to increase in importance. Primary tourist attractions include landform scenery and historical sites and memorials. The opening of expressway 1993, agricultural tourism such as growing sunflower for visitors has gradually spread into this region. During 1970s, under the Nagano prefectural government project, in both of Omi-mura and Sakakita-mura, to accommodate non-agricultural commuting workers, some residences of housing estate have built and been facilitated.

All matters mentioned above are reflecting the transition of the landuse.
V. Conclusion

Although regarding the condition of transportation and high accessibility to urban centers, it is certain that this Chikuhoku region has been well favoured with, but this region has not been blessed with abundant water resoures. Under recent circumstances, expansion of the tourism would be also inevitable in this region and it might be mostly expected to support regional peoples economic life. Such trend certainly would affect heavily on landuse transition and water resource management. So, how to save and how to use effectively scarce and precious water resource should be the most important subject of the Chikuhoku region.

We can find and identify some characteristic topographical features of the hillyland area from the Fig. 4. In the foreground narrow and small basin surrounded by planted pine trees can be seen. Middle grond is relative low altitude hilly landform ridges exhibiting small ups and downs that had and has made peoples active communications possible. Mt.Hijiri is in the central distant view showing monadnock skyline shape, extending gentle slope on its southern foothill. Visitors can enjoy nice sitseeing by such the wide extending view. Some of them might be stimulated their nostalgic feelings. Such landscape will attract more and more people and will become tourism attraction.

SUMMARY

Obtained results can be summarised as follows.

1. This region exhibits distinctive history. Consistently all the times from the ancient till recent days, in various communications, this region had and has been favoured with the easy accessibility to other areas, above all, the Miyako, national capital. That was possible through the relay station system of Ancient and Middle Age, through the stage town system in pre-Modern age, and the railway, expressway of Modern Era. Hilly landform and nestled flat land within tiny areas were the key factors that brought about transportation development. Those are reflected in the remaining of old aged ancient original temples and shrines, and in case of modern Era, prosperity of coal mining for large urban market backed-up by railway.

2. For the people in this regin, water resouce development and management has been always acute problems. To be without high altitude and large volume mountains resulted in small and short river systems. Relative short annual rainfall of 900 milli meters make hydrological circumstance more unfavourable. This region had frequently suffered from water scarcity and people in this region had to devise various method to overcome water deficiency. Water resource and water consumption have two sectors, one is for domestic use and other is for irrigation purpose. Spring waters and well waters are supplying
mainly for domestic purpose. Irrigation waters are obtained from river surface streams or some reservoirs. Under the life modernization, domestic water supply have evolved from the small individual unit of obtaining by each consumers to the large unit collective supply through pipe system. Multi-purpose large Onikuma dam are under construction. It is expected to become effective measure both for domestic and irrigation water supply.

3. Evolution of land use and agricultural activities are unique. Devoted land to padi-field had and has been limited on narrow river side area, and rice production is mainly for farmer's own consumption. Cash crops for sale had been cultivated mainly on the dry upland field. In pre-modern Edo-Era, kozo (materials for Japanese pater), tobacco and hemp were prosperous. From the beginning of 1900 till 1960s sericulture field had been prevail over. Recently, some of the former sericulture field has converted to orchard or vegetable production. But, by competition from abroad market, upland fields abandoned are increasing, in due order working conditions are more unfavor, with steeper gradient or more far distant from the farmer's home.
歴史と生活の容器たる自然環境の最も基本は、当地域が川崎丘陵の一角を占める事実である。川崎丘陵は県内をもその一部にし、新潟県下の魚沼丘陵や新潟の丘陵におよぶ。地質学的には、秋田県から山形県を経て新潟・長野両県におよぶ、緑色凝灰岩の卓越する、第三紀中新世から鮮新世起源の区域に重なり、広大な領域におよんでいる。その丘陵地の地形の形成は、更新世の台地よりは古いが、山地よりも新しく、現在の川の下方浸食を受ける以前の、長野・松本両盆地の陥没に先じて準平坦地形の発達をみた。地形学的追跡により判明した、連続する平坦面は、より古くより大きな高度からより新しい小さな高度に向かい、乗越面・中島面・大倉面に大別される。これら残存の準平坦は、人々に緩やかで利用しやすい地形を提供し、かつての里山の入会林野・高原野菜の栽培・畜産・果樹園そして近年の高速道路の通過経路となった。この丘陵地はまた河川の浸食作用のため幾つもの小さな盆地に分かれた。ある盆地から隣の盆地へは浸食から残った低い尾根を越えず容易に行け、これが古代から幹線交通路の通過を可能にした。そのため、古代の官道は中世の伝馬道へ、さらに近世の宿駅制へと継承され、宿場をつなぐ北国西征はそのまま近代の鉄道になり、さらに現代の中央道長野線に継承されている。

丘陵地の高度はせいぜい1500m あまりで、山地よりだいぶ小さく、河川も短く、浸食谷も浅いから、降水量蓄容量は小さい。内陸性の気候がこれに加わり、筑北地域は水資源に乏しい。この克服に様々な努力が払われてきた。透水性のある比較的柔らかい砂岩を掘れば、井戸水が得られたから、近世の宿場の場所は青柳集落は砂岩の上に作られている。聖山や四阿屋（あずまや）山は第三紀層へ割り込んだ火山岩で残丘地形を示し、硬く緻密な安山岩中の小さな多数の亀裂に含まれた水を1960年代から水道用水に活用してきている。完成間近な別所川水系の小仁熊ダムは水系の異なる東条川と結ぶ、信州には珍しい、洪水調節よりも貯水を主目的とするダムである。

多様な地下資源を含む緑色凝灰岩は当地域では石炭を埋蔵し、品位は亜炭の部類程度であがったが、鉄道開通後は松本や岡谷の製業業向けに、また販売直売には燃料の不足した首都圏向けに、活発に採掘され輸送された。盆地の周囲の山地は森林に覆われており、石油燃料に市場を奪われる1960年代までは建築材・薪炭の採取が活発であった。これらもまた鉄道で都市の市場に送られた。かつて利用価値が高く、頻繁に森林を利用したので、その結果赤松林が多く見られる。しかし燃料だけでなく建築材も輸入に代わり、目下は森林は荒廃しがちである。

農業では、稲作は自家消費を主であり重要ではない。小規模であったが畑菜には様々な栽培作物があり、筑北地域の農業の特徴を示した。近世からタバコ、楮、麻が作られ、タバコは江戸にも知られていた。鉄道開通後は養蚕が盛んになったが、1960年を境に衰退し、入れ替わりに果樹・苗木・畜産・花や野菜の種子、そして冷やしの高原野菜が伸びた。

1960年以降鉄道の電化・幹線道路の県道から国道への昇格と幅広な舗装の継続的な改修があり、1990年代末の中央道長野線開通と接続道路の改良が交通ネットを高めにかけた。幹線交通路に常に接し得た筑北地域は1960年代には麻績村の聖山麓の観光開発、また1970年代と80年代には麻績・坂北両村で通行者の取容住宅地を開発し、住民が定着した。幹線交通路の変革にともなって、聖高原・差切峠・青柳城址・青柳宿などがより広域に知られ、さらに向日葵栽培で観光客を受け入れをはかるなど、農業も観光の一部になった土地利用の変化も進
行っている。

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