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Regional Planning in the Tennessee Valley

—focus on the Transfer and Transformation
of the TVA—

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Abstract

The historical development of the Tennessee Valley Authority (TVA) and the fundamental concepts of its comprehensive development such as unity of men and resources, grassroots democracy and decentralization are firstly introduced. Thereafter, with reference to the transfer of the TVA principles into the Kitakami Comprehensive Development with only a river-related infrastructural project, the fundamental concepts of TVA are in fact not fully understood. Finally, the regional sociology in Japan based on the understanding of regionalism by Odum that provided the foundation of TVA will be established.

Key words: Regional planning, TVA, Unity of man and resources, Grassroots democracy, Decentralization, Kitakami River, Regional Sociology.

1. Introduction

With the annual floods that intimidated the Tennessee Valley, the development of agriculture on the riverbanks, industries, towns and villages and transportation were impeded and residents led lives threatened by fear and distress. However, with the establishment of the Tennessee Valley Authority (TVA), this region was to become an example of comprehensive development, demonstrating to the world the most well-known historical proof of modern America's democracy.

In this paper, the historical development of TVA and the fundamental concepts of its comprehensive development are firstly introduced. Thereafter, with reference to the Kitakami Comprehensive Development Planning case, the transfer and transformation of these ideas into Japan's river basins will be described. Finally, the subject of regional society, a vital issue in Japan's regional planning, will be discussed.

2. The Comprehensive Development of TVA

The inauguration, progress and development projects of the TVA is first outlined, after which its Corporation Act and fundamental principles will be discussed.

2.1. Inauguration of the TVA

With the discovery of the steamship in 1870, river navigation rapidly flourished with the establishment of a steamship company in Alabama. During this time, the Tennessee River, with a declaration from Monroe, was renovated for navigation, thus making it an important feature.

Later, various types of canals were constructed by the Federal government and the age of electricity also brought about the construction of several dams along the Tennessee by the Alabama Electric Company.

The Federal Government, in 1916, constructed a large dam called the Wilson Dam in Muscle Shoals, Alabama located 418 km from the Tennessee estuary in the upper reaches, and planned to supply electricity through the construction of a hydro-electric generator with a capacity of 610,000 kW and a power generator of 35,000 kW. At the same time, the Federal Government also planned for the construction of a large scale air nitrogen solidification plant in Sheffield, Alabama utilising the generated power to manufacture mainly nitric acid. However, the termination of the war in 1918 deemed nitric acid no longer necessary and the government constructions were abandoned, largely unused.

In 1925, the Wilson Dam was completed in which 4 units each of 30,000 kW and 35,000 kW generators were constructed generating a total of 260,000 kW.

At that time, the Nebraska senator, J. W. Norris, a progressive republican and the chairman of the Agriculture and Forestry Committee of the Upper House, thought that the prices of an autonomous private electric company was unjustly high. He therefore propagated the idea of the government managing the Wilson Dam power generation facilities, etc. and the supply of cheap power, thus controlling the unjust high prices of electricity.

Meanwhile, in the interests of resource conservation and in order to develop comprehensively the Tennessee River Basin and not just limiting it to power development, the Federation's Congress carried out a detailed survey of the basin. Up until now, such a large-scale detailed survey of the entire basin has never been conducted. In this survey, aerial photography was employed especially for the drawing of maps, and as a result, a vast area of 5,650 sq. m ϕ . could be covered in a short span of time. However, the costs were enormous.

The contents of this reconnaissance survey included various aspects of navigation, flood prevention, power generation, water resource management and forestry. The preparation of the materials necessary to develop comprehensively the basin took up to 1929 for completion.

In 1926, President C. Coolidge established an Investigation Committee to deal with the problem of the Muscle Shoals power plant and nitric acid plant, but failing to come up with any concrete conclusions, the problem was abandoned.

In response to this, Senator Norris presented a bill calling for the Federal Government to operate the Muscles Shoals plant and power generator and also to manage the transmission and distribution operations. The bill passed through both the Lower and Upper Houses, but President Coolidge vetoed against it and the

bill never came through.

President Hoover too, thought of the operation through an organization that represents the various states of Alabama, Georgia and Mississippi and presented the bill, but as the Congress paid little concern for it, it was also passed.

The 1920's saw liberal American capitalism reaching its peak as monopoly took its grip, and this rapidly stimulated the germination of the Great Depression in 1929.

In the midst of the Great Depression in 1933, President Roosevelt, who then took over the Presidency, devised a basic policy to combat this unprecedented depression. This was the New Deal Policy that greatly changed the American society.

As guiding lines, three things were raised. The first was the eradication of depression, the second was the positive participation towards economic activities of the government and the third was the policy of monopoly.

In connection to this New Deal Policy, the TVA came into being.

The execution of positive comprehensive projects by the government was not just only the eradication of depression starting with the unemployment problem, but with the government's own participation in the power industry. The controlling of electricity prices as an anti-monopoly measure against electricity enterprises who play an essential role among American monopoly enterprises, is of great significance. With this, the long-pending issue of Muscle Shoals was solved in the comprehensive development of the Tennessee River Valley.

While serving his term in office in March 1933, President Roosevelt sent a message to the Congress, presented the Norris bill to the Upper House, the Hill bill to the Lower House and in May the same year, the TVA Corporation Act was enacted and officially inaugurated.

Based on this Corporation Act, the President named Dr. A. E. Morgan as the chairman and in 1941, D. E. Lilienthal took over the office.

2.2. Development Project of TVA

(1) Electricity-related projects²⁾

There are many dried desert belts in America, and the Tennessee Valley with a warm climate and annual precipitation of 1200-1500 mm belongs to an area of heaviest rainfall. Figure 1 is a map of the Tennessee Valley.

At the time when TVA was inaugurated, there were several dams constructed by the Alabama Electricity Company in the Tennessee Valley and the above mentioned Wilson Dam in Muscle Shoals. Wilson Dam is 41.8 m high, 1384 m long with a pondage of 790 million m³ and 21 generators turning out a total of 630,000 kW at present. The dam is installed with a new and old sluice for water traffic. The new one is 33.5 m wide and 183 m long with a water level gap of 30.5 m maximum while the old one, installed since 1959 is 8 times in scale.

Since the inauguration of the TVA, large dams has been continually constructed, amounting to a total of 29 main dams, including those under purchase and construction. The number further increases when considering the dams of the Aluminium Company of America (ALCOA) constructed on the tributaries.

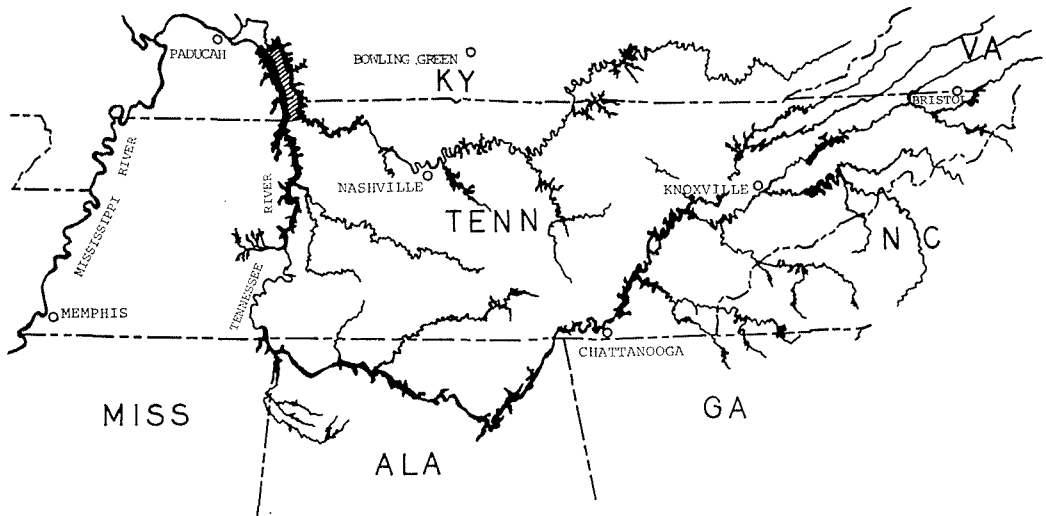


Figure 1. The map of the Tennessee Valley.

From this, the 9 dams constructed along the Tennessee River, running 1,040 km from the Ohio River confluence at the Paducah to the upper reaches of Knoxville, forms a canal of steps created by the sluices that are used for navigation. With the opening of the canal, safe navigation was made possible and in 1975, the tonnage totaled 28,000,000. Through navigation along the canal of 21 states linked by the Tennessee River, this region extended its links from the wider region to Western Europe and the rest of the world. As navigation in this region was cheaper than any other transportation means in cost, industrial location was extremely advantageous, and coupled with electricity and water resources, industrial location and employment flourished in this interior land.

The total pondage at the highest level of the main dams in the Tennessee Valley reached 29,800 million tons, and was higher with the inclusion of the tributary dams.

The pondage of the dams' reservoirs are controlled according to the water cycle of the valley and rises to its height around June every year, after which the water is successively released. Then, in preparation for the flood season from winter to spring it falls to its lowest from the end of December to January, during which 14,800 million tons of flood control water are stored.

In Japan, the usable pondage of existing dams, reservoirs and lakes can be estimated around 12,000 to 13,000 million tons; the flood control capacity is low and is not maintained for navigation. Thus, when compared to the pondages of the Tennessee River, we can imagine the immense scale of the latter. Its flood control capacity corresponds to 10% of the entire valleys annual precipitation and 25% of the annual discharge.

Information on the Valley's rainfall and water level of dams is collected through 175 rainfall measurement stations, 50 rainfall telemeters located in remote areas, 25 discharge measurement stations as well as from each dam. Furthermore, flood

warnings are sent via the Chattanooga electricity control station computer to the Knoxville Administration center where the dam gates are operated.

A notable feature is that water management in TVA by the TVA Corporation Act places priority on navigation and flood prevention over power generation.

At the TVA, estimated flood area and projected damage costs before dam construction based on past records and documents are compared to present results of flood control by dams, after which the efficiency is measured and used in propaganda towards the valley's inhabitants and related purposes.

The flood of the Tennessee River covers the flood control of the lower reach of the Ohio River as well as part of the main Mississippi River, and greatly contributes to the flood prevention of the agricultural belt in the lower reaches.

The electricity development of the Tennessee River allowed reasonable electricity prices to take over those of the monopolistic private electric companies.

When the TVA was inaugurated, electricity was expensive and the residents were poor. Furthermore, as electricity was distributed over a wide area, the costs were high. As a result, only a few farms were supplied with electricity.

Today, the TVA electricity is consumed by 2,500,000 people with an increase of more than 70 times and a 100% electrification rate of farms.

Electricity prices were also reduced by the TVA with household prices cut down by 1/5 in 1960 from the time of inauguration. In recent years, prices have been rising due to rising costs but still remains half of that during the TVA's inauguration and 2/3's of the U. S. average electricity prices.

The hydro-electric power of the Tennessee River combined with that of ALCOA's makes up about 4,500,000 kW.

Hydro-electric development practically ended around 1945, but as electricity demand expanded, construction of coal generation plants took over in 1949 with nuclear power plants appearing from 1967. Today, there only 13 projects under operation with the highest output of 20 million kW.

(2) Forest Conservation Project.³⁾

Although the TVA is seen as an electricity development project, it in actual fact endeavored in the development of agriculture, forestry and fishery industries of the valley from its inauguration. It especially worked towards solving the unemployment problem of the Great Depression in connection to the conservation of forest which occupies 60% of the valley area and water resource.

When the TVA was inaugurated most of the wild forests in the valley forest had disappeared and a large part of the forest were ruined by unplanned deforestation and burning.

With the cooperation of each state, forest owners, and enterprises, the TVA set up an organization for forest recovery, that established a seedling nursery for the reforestation of a few million trees and supervised the planning of forest fire prevention and forest management.

However, the TVA River Valley runs about 1,600 km from the Appalachian Mountains watershed in the upper reaches of Virginia to the Ohio River confluence

in Paducah on the lower reaches of Kentucky, and stretches approximately 106,000 km² in all through 7 states. Therefore, as natural and economic conditions differ from region to region, differences are found in the forest's public and economic orientation, and surveys are conducted according to the characteristics and issues of each region. Thus, for the necessity of data collection based on scientific research results, investigations were initiated on the functions of forest flow regulations, erosion prevention, etc. in relation to soil conservation in agriculture.

Two years after the inauguration in 1935, the White Hollow experimental station was set up in the upper reaches of the Norris Dam near Knoxville. Following this, during the Second World War in 1941, the Pine Tree Branch experimental station was established on the Beech River, west of Nashville. In 1960, Citico Creek experimental station 48 km south of Knoxville and in 1962, the Upper Bear Creek experimental station in Bear Creek south of Muscle Shoals in Alabama. These stations investigate mainly on the basins water and geological flow.

The Stanco Branch experimental station set up on the east of Huntsville, Alabama in 1968 was conducting a Water Quality Environmental investigation on the impact of the regions coal opening-mining development on water quality. The investigation was also carried out in 1976 in Fentress District, Tennessee, 5 km to 20 km south of James Town located about 100 km north-west of Knoxville.

In the three experimental stations of Long Branch, Crooked Creek and Trib Crooked Creek, too, the impact of coal open-mining development on water quality and the impact on biological environment in the lower reaches are being investigated.

Moreover, in connection to air pollution brought about by smoke discharge from the annual consumption of 4,000 tons of coal used in power generation, a forest experimental station was set up with the aim of investigating into the impact on environmental conditions covering wide environmental conservation issues of forest and moisture experiments.

Besides these, three mountain experimental station, west of Ashville, North Carolina opened from 1949 to investigate agricultural land conservation and the Parker Branch experimental station opened in 1953.

In the TVA Valley today 500,000 ha. have been reforested, soil erosion prevention is progressing, forest fires are reduced, wild animals have increased, accumulated forest is more than twice of that 40 years ago and its growth is more than three times its deforestation.

As a result, population engaged in forestry and forestry processing industry has reached more than 50,000. In these conditions, forests in the valley endeavors towards solving the integrated issues of water resources, landscape, forestry and forest recreation.

2.3. Tennessee Valley Development Corporation Act.⁴⁾

The enactment of the Tennessee Valley Development Corporation Act was aimed at the improvement of navigation and flood prevention on the Tennessee River, the utilization of undeveloped regions, reforestation of the Tennessee Valley and the promotion of agriculture and industry.

The Corporation Board is made up of three directors and a chairman appointed by the President after obtaining advice and consent from the Upper house. The remaining staff is appointed by the board of directors. While in Office, the directors are not to engage in other work but to devote themselves entirely to corporation duties, supervising and directing the full authority of the corporation. However, they are forbidden to hold financially profitable relations with any electricity supply company whatsoever.

In spite of the regulation of the Public Service Acts applicable to employees and staff of the U. S. government, the Corporation Board can appoint the staff necessary for the implementation of duties, determine the salary and delegate duties.

Besides the general corporation rights, the corporation also has the right to exercise Land Expropriation Rights in the name of the U. S. Consequently, it can acquire real estate necessary for power plant as well as construction of other buildings and navigation works, and in cases where prices offered by the corporation are turned down, it can acquire land through the Land Expropriation Rights.

These rights extend to that of constructing dams and reservoirs along the Tennessee River and its tributaries for flood prevention in the Tennessee and Mississippi Valleys. It is able to construct power plants, power distribution facilities, navigation and associated works. It may also lease corporation-owned or corporation-owned or corporation-run estates as recreation facilities.

It provides advice and cooperation to protect the lives of those who are made to move as a result of land expropriation for development projects, and cooperates with the federal government, state and local public authorities.

The Corporation Board may, with the aim to increase the production and lower the prices of fertilisers, produce and sell through self-conceived methods for utilisation of existing facilities modernization of plants, construction of new plants or the costreduction of fertiliser production. In order to derive reports on the costs, effectiveness and best methods of using fertilisers, and together with agricultural experimental stations and agricultural colleges may present or sell fairly and equally products from the self-run factories.

The corporation may request for assistance and advice of officials of Ministries of the U. S. and may issue orders to the respective authorities on the above matters in cases where the President has recognised them as necessary for public and economic benefit. Recipients of such orders must follow the orders, rules and regulations of the Corporation.

The appointment, employment and promotion of corporation staff rests purely merit and capabilities and not on political affiliations. Violation of these conditions by the directors may result in dismissal when deemed fit by the President. Similarly, the Corporation may also dismiss any appointed employee who violates these conditions.

The Corporation headquarters was not in Washington, but situated near Muscle Shoals in Alabama (although the present headquarters is in Knoxville).

The Corporation confers annually in December with the President during which

the financial report of the corporation national accounts and a complete report of projects must be presented.

The purchase and contracts on all goods and services by the Corporation must be made after ample knowledge and competition are assured giving enough time prior to bidding and announcement.

The National Accounts Investigation Department conducts strict investigations during a self-determined period at least once a year during the mid-term of the planning period.

The Corporation must improve navigation, control river discharge for the main purpose of flood control in the ownership and management of dams and the operation of reservoirs. As long as they do not violate these objects, power facilities can be constructed and operated, power distribution and sale of electricity can be conducted, and whenever possible to work towards the corporation's cost redemption and facilities maintenance.

The Corporation may sell surplus power to states, provinces, cities, companies, unions and individuals but priority is given to state, province, city, farmers and citizens' cooperative bodies whose main objectives are to supply electricity to all members in the region.

Surplus power in the Muscle Shoals region is firstly, economically supplied to benefit the entire region residents especially households and farmers consumers. Secondly, it is used as industrial power and is increased according to the power load rate. In this way, the supply rate to household and farmers is made possible, and consequently, electricity is use in households and farms are encouraged.

In order to promote the proper use, conservation and development of the natural resources of the Tennessee Valley, as well as to improve the general welfare of the inhabitants, the President has the authority to design comprehensive plans and useful investigations when guiding and supervising the scope, order, and character of development that are fairly and economically promoted, either through raising public funds or through the guidance and supervision of the public bodies by the Congress or state authorities. The purpose is to create an orderly development of nature, economy and society in the respective regions. These investigations may call for the cooperation of the states concerned and the authorities under them, cooperatives and other groups in the planning work have the authority to guide research, experiments and practice necessary and proper for the objectives.

Following the promotion of the projects, the President advises at the occasional meetings of the Congress in the proper legislation in order to fulfill the objectives. The following are the special items found within the scope of the main objectives.

- (1) maximization of flood prevention
- (2) maximum development of the Tennessee Valley for navigation.
- (3) maximum power development without affecting the improvement of navigation and flood prevention.
- (5) proper reforestation methods of land in respective regions
- (6) economic and social welfare of residents in the respective regions.

In order to comprehensively develop the Tennessee Valley, all plans on the construction, operation and maintenance of dams and related engineering works and other hindering works along the Tennessee River or its tributaries that exerts influence on navigation and flood prevention or on public and protected land, must be approved by the Corporation Board. Even after approval by the board changes in planned facilities require further permission.

The above outlines the basic characteristics of the Corporation Act.

According to the Act, the TVA holds full responsibility concerning the development and conservation of the Tennessee River, and attempts as far as possible to improve the welfare of the inhabitants. In the implementation of the plans, extensive pre-and post-surveys are conducted using methods which rival those of the environment assessment of today. In the development of the Valley, it also holds the all-round responsibility of planning a comprehensive, unified social and physical environment and ensuring its implementation, not only for power development but for the improvement of the general welfare of inhabitants.

2.4. Guiding Principles of TVA⁴⁾

The principles of TVA on the development through unity of men and resources, grassroots democracy and decentralization will presently be discussed.

(1) Development through the Unity of Man and Resources

In administering a project of such broad scope, the TVA inevitably calls for men in various technical fields resulting in a high degree of specialization. In the implementation of TVA projects, many different kinds of professional and technical skills like geologists, agronomists, foresters, chemists, architects, experts in public health, wild life and fish culture, librarians, wood technicians, specialists in recreation and in refractories, accountants, lawyers and so on. In this way, the scope of the TVA covers the entire scope of natural and social environment.

Thus, the implementation of TVA projects calls for the integration of highly specialized professional and technicians and development through the unity of man and resources. These professionals and technicians do not only have a wide insight on matters outside their realm, but recognize the relative importance of their own work, and those selected are also able to evaluate the value of other work when compared with their own. Otherwise, the very fact of the highly specialized men may endanger the fulfillment of the common purpose of development through the unity of man and resources.

Therefore, the TVA Board exchanges views with the professionals and experts, introducing specialized views on wider public interests — the welfare of the valley inhabitants.

With this TVA objective, professionals and technicians engage in the projects were able to expand their views and scope of their own speciality, and welcome interdisciplinary links with other fields. This is further extended to administrators, implementors and the region's inhabitants. In other words, the unifies development of resources must become the common purpose of all the people and all the

agencies of the entire valley, otherwise the objective if TVA would not be fulfilled.

Lilienthal describes the effect of unified development in the following way.

"There is a grand cycle in nature. The lines of those majestic swinging arcs are nowhere more clearly seen than by following the course of electric power in the Tennessee Valley's way of life. Water falls upon a mountain slope six thousand feet above the level of the river's mouth. It percolates through the roots and the subsurface channels, flows in a thousand tiny veins, until it comes together in one stream, then on another, and at last reaches a TVA lake where it is stored behind a dam. Down a huge steel tube it falls, turning a water wheel. Here the water's energy is transformed into electricity, and then, moving onwards towards the sea, it continues on its course, through ten such lakes, over ten such water wheels. Each time, electric energy is created. That electricity, carried perhaps two hundred miles in a flash of time, heats to incredible temperature a furnace that transforms inert phosphate ore into a chemical. That phosphate chemical, put upon his land by a farmer, stirs new life in the land, induces the growth of pastures that capture the inexhaustable power of the sun. Those pastures, born of the energy of phosphate and electricity, feed the energies of animals and men, hold the soil, free the streams of silt, store up water in the soil. Slowly, the water returns into the great man-made reservoirs, from which more electricity is generated as more water from the restored land flows on its endless course.

Such a cycle is restorative, not exhausting. It gives life as it sustains life. The principle of unity has been obeyed, the circle has been closed. The yield is not the old sad tale of spoliation and poverty, but that of nature and science and man in the bounty of harmony."

(2) Democracy at the Grassroots.

The special feature of TVA originates in modern democracy, that is the full participation of the region's inhabitants through, to borrow the words of Lilienthal, democracy at the grassroots.

Just how do this grassroots democracy work? Lilienthal describes its necessity in the following way.

"It is the unique strength of democratic methods that do provide a way of stimulating and releasing the individual resourcefulness and inventiveness, the pride of workmanship, the creative genius of human beings whatever their station of function, and however large the enterprise of which they are a part. A world of science and great machines is still a world of men; our modern task is more difficult, but the opportunity for democratic methods is greater even than in the days of ax and the hand loom.

A method of organising the modern task of resource development that not only will be based upon the principle of unity but can draw in the average man and make him a part of the great job of our time, in the day-to-day work in the fields and factories and the offices of business, will tap riches of human talent that are beyond the reach of any highly centralized, dictatorial, and impersonal system of development based upon remote control in the hands of a business, a technical

or a political elite.

It is just such a widespread and intimate participation of the people in the development of their valley that has gone on in the Tennessee Valley.

The spiritual yield of democratic methods, a renewed sense that the individual counts, would be justification enough. But there is yet another reason, a practical one, for seeking at every turn to bring people actively into the tasks of building a region's resources; that is, I think, really no other way in which the job can be done. The task of harmonising and from time to time adjusting the intricate, detailed maze of pieces that make up the unified development of resources in a world of technology is something that I do not believe can be done effectively from some remote government or business headquarters."

Under the guidance of the TVA, land improvement projects were completed by following grassroots democracy. During that time, land in the Tennessee Valley were almost exhausted, and in rural counties, were without a single telephone, a mile of farm electric line, a public library, a newspaper or a single hospital. Thus, in order to improve the standard of life on the farms, land had to be improved. This calls for the unification of all available knowledge of all kinds available at the state universities's experimental farms and some how to move to thousands of valley farms, actual farms. As a result, several hundred thousands of demonstration farms were set up and in these farms, the unified principle and planning and implementation of resource development were done by the people. The TVA introduced the intensive application of agricultural science and technology in the solution of the problem of demonstration farms. Furthermore, fertilisers were produced in large amounts and used at these farms. In this way, the maintenance of land fertility were taught to the people.

Consequently, the working together of the people, the improvement of land did not only raise the incomes of farmers; but hasten the improvement of living standards of the general community. In 1944, the Knoxville business and civic groups got together with the University of Tennessee and TVA to sponsor an East Tennessee Community improvement contest, which later spread throughout the entire state. In many counties, health programs, with clinics for children, community buildings built as social centers and educational tours to other states were all set up, setting a spark to community life.

With the introduction of electric lines, the lives of farmers improved tremendously, organising their own electric cooperatives, sometimes against the opposition of private agencies.

Lilienthal describes this in the following way.

"When the principles of grass-roots democracy are followed, electricity, like soil minerals, provides men with a stimulus in their own lives, as well as an opportunity to work together with others toward a purpose bigger than any individual. By that act of joint effort, of citizen participation, the individual's essential freedom is strengthened and his satisfaction increased.

A common purpose furthered by grassroots methods not only draws neigh-

bors together in a community, then in a county and a group of counties; as time goes on the whole region, from one end to another, has felt the effect. The North Carolina farmers in the high mountains of Watauga or Jackson counties are brought closer to the Virginians and to the Alabama and western Kentucky farmers of the red clay flatlands. A common purpose is making this one valley."

(3) Decentralization

The purpose of the methods of decentralization is to provide greater opportunity for a richer, more interesting and more responsible life for the individual and to increase his genuine freedom, his sense of his own importance. Centralization in administration tends to promote remote and absentee control, and thereby increasingly denies the individual the opportunity to make decisions and to carry those responsibilities by which human personality is nourished and developed.

The Congress established the TVA as a national agency, but one confined to a particular region. This provided an opportunity for decentralization. A limited region, its outlines drawn by its natural resources and the cohesion of its human interests, was the unit of federal activity rather than the whole region. To the degree that the TVA experiment serves the decentralization interests history may mark that down as TVA's most substantial contribution towards national well-being and the strengthening of democracy.

Decentralization is anything but an easy task. The energies and zeal of our citizens must be developed to keep open the channels through which democracy is constantly invigorated.

When a major depression struck in 1929 business over-centralization resulted in power going to the center, local businesses were choked and great losses were incurred by powerless municipalities due to remote control.

As a result, decentralization in TVA administration was legislated by Congress. Without this opportunity given by the Congress, it is believed that decentralization in TVA would never have developed.

To make it possible for citizens of the regions concerned to hold decision-making power and participate positively in TVA, TVA's headquarters was established not in Washington but in Knoxville.

The realities of the regions were well understood by those who implemented TVA projects and would seek for permits from the central government when prohibited from implementing responsible. Consequently, department and district administrators and site staff of TVA were selected, trained and entrusted with wide responsibilities and free discretion powers.

Lilienthal describes the differences between decentralization and sectionalism in the following way.

"Modern regionalism, by contrast, rest squarely upon the supremacy of the national interest. It admits that there are problems and resources common to areas larger than any single state — a river basin, for example. It recognises that certain points of view develop in some portions of the country and are not shared by the nation as a whole. It affirms and insists, however, that the solution of regional

problems and the development of regional resources are matters of concern to the whole country. It proposes to harmonize regional advancement with the national welfare. That concern for and supremacy of national interest distinguishes "regionalism" from "sectionalism". Under the banner of sectionalism, states throughout our history have combined to support or to oppose federal action. Under the concept of regionalism, the federal government acts to meet regional needs to the end that the entire nation may profit.

The organization of the Tennessee Valley Authority is an example of this modern idea of regionalism. To create it seven states did not unite to demand special privileges to distinguish them for, the country as a whole, regardless of the ensuing consequences to the national welfare. The federal legislature itself created an autonomous regional agency whose basic objective was to conserve the natural resources lying in the valley of the Tennessee and to develop those resources on conformity with broad national objectives and policies. This is the very opposite — indeed it is the antidote — of "Balkanization".

The idea of regionalism embodied in the TVA — a federal agency decentralized in fact — offers a rational way of harmonizing regional interests with national interest."

He further discusses about decentralization in the following way.

"The decentralized administration of federal functions is no infallible panacea. Of course mistakes are made at the grassroots. But even the mistakes are useful, for they are close at hand where the reasons behind them can be seen and understood. The wise decisions, the successes (and there are many such), are a source of pride and satisfaction to the whole community. If, as I strongly believe, power of all kinds, economical and political, must be diffused, if it is vital that citizens participate in the programs of their government, if it is important that confidence in our federal government be maintained, then decentralization is essential.

I speak of decentralization as a problem for the United States of America. But the poison of overcentralization is not a threat to us here alone. Decentralized administration is one form of antidote that is effective the world over, for it rests upon human impulses that are universal. Centralization is a threat to the human spirit everywhere, and its control is a concern of all men who love freedom."

3. Transfer and Transformation of TVA

In this section, the Special Regions Comprehensive Development Planning will first be dealt with, after which the so-called TVA of Japan, the Kitakami Special Regions Comprehensive Development Planning will be discussed.

3.1. Special Regions Comprehensive Development Planning⁵⁾

In December 1947 a Resource Committee that incorporated American ideas revolving around the TVA was established at the Economic Stability Headquarters.

This committee undertook various tasks of conducting regional planning investigations, and based on these results gives advice to the Prime Minister's Cabinet.

Later, in June 1949 the committee changed its name to the Resource Investigation Council, and following the establishment of the Science and Technology Agency in May 1956, the council came to be attached to this Agency.

Regarding national land planning, a Comprehensive National Land Development Commission was established in the Economic Stability Headquarters working on the preparations for a legal system of national land planning. Thus, in May 1950, the National Land Comprehensive Development Act was promulgated. In this Act, the National Land Comprehensive Development was subsectioned into 4 parts — National Comprehensive Development planning, Prefectural Comprehensive Development Planning, Rural Comprehensive Planning and the Special Regions Comprehensive Development Planning of these the National Land Comprehensive Development Planning represents the highest level of planning.

However, organization at the national, prefectural and rural levels did not proceed smoothly.

The National Comprehensive Development Planning took 12 years until the Cabinet's decision in October, 1962 to be finalised.

However, the Special Regions C. D. P. was quickly raised in the National Land Comprehensive Development Commission and in 1951 the Standards for Special Regions Designation were decided. These standards are summarised as:—

1) The Special Regions designates regions concerned with resource development, industrial promotion, national land conservation, disaster prevention, etc. and regions with high efficiency for achievement of economic self-sufficiency objectives through high level comprehensive policies.

Consequently, 4 types of region are presented.

(a) Resource development regions are well-endowed regions of underutilised and undeveloped resources with goods and services requiring the urgent production of power, food, raw materials, etc. These regions contains national and other development works and plans, have large investment returns, require strong promotion, where development goals of essential goods are made redundant, require land use adjustment and needs inter-complementary planning. Resource development has been delayed due to market and transportation relations but are designated as regions highly valuable towards higher production of essential goods, intensification of land and resource utilization, and the increased accomodation of population.

(b) National land conservation, disaster prevention regions designates regions with constant and large-scale disasters like typhoons and floods, soil erosion, land subsidence, etc. where disaster preventionbuild-ups are either also industrial facilities or can be integratively developed with other facilities ; and regions requiring measures or special facilities to control development for purposes of conservation and disaster prevention.

(c) Urban and peripheral regions, including cities if the above two possess close natural, economic and social linkages and high potential in production and transportation. Furthermore, they are regions covering widely the benefits derived from either the need for the appropriate location of industry and population arising

from the construction of facilities in an urban and peripheral area, or the construction of facilities for economic sufficiency and industrial rationalization.

(d) Other regions while being in consistency with the above three criteria, are entrusted with the task of national economic development and improvement of social welfare and are seen as regions of prospective integrative efficiency in redevelopment and tourism.

2) The designation of Special Regions in principle is not confined to administrative boundaries but are districts with direct relations to the fundamental purpose, the smallest unit being the municipal unit. Riverine, lakeside, and seaside districts should be considered under a common unit.

3) In brief, the Special Regions Designation are dependent on the urgency of development goals, the region's overall development potential, prospects of development and development effects.

4) In addition to the above, the resultant proposed sites are designated, the scale and contents of which are investigated and ranked. Urgency of development goals and economic impacts are evaluated.

As the Construction Ministry is in charge of guiding the prefectures and surveys conducted on the Special Regions C. D. P. Policy, the prefectures are naturally concerned during the setting of standards, and out of 42 prefectures, 51 proposal sites are selected by the Ministry.

In 1951, with the regulations standardised, the following 18 regions were designated.

Anitazawa, Mogami, Kitakami, Todami, Tone, Hietsu, Noto, Tenryu-Higashi Mikawa, Kiso, Yoshino-Kumano, Daisen-Izumo, Geihoku, Kinshu, Nagakawa, Shikoku Seinan, Kita Kyushu, Aso, Minami Kyushu.

Later, in 1957, the regions of Towada, Iwakigawa River, Kitaon and Sensho were added and Tsushima was replaced with planning policy and implementation according to the Remote Islands Act.

Among these, the first to present its planning report was the Kitakami region in 1953.

3.2. Kitakami Special Region Comprehensive Development Planning⁶⁾

The Kitakami Region is the largest basin in the Tohoku Area. In 1947 and the following year, the Kitakami River overflowed following the attack of the Typhoons Kathleen and Ayon Causing a major flood. As a result, a bill to build 5 dams for water reservation was presented by the Construction Ministry. This plan covered a varied scope and being the first such project in Japan, it later came to be known as the TVA of Japan.

The Kitakami C. D. P. was not a sudden move, but the result of a long history of related issues. In 1913, the Great Frost attacked the Tohoku Area and protagonic financial figures including the Internal Affairs Minister Takashi Hará and Eiichi Shibusawa from the Tohoku Promotion Committee, but the 1929 World Depression paralyzed this movement. In 1934, however, the Tohoku Investigation Committee was established in the Cabinet, the Sendai Branch of the Internal Affairs

Ministry was ordered to conduct an investigation on the Tohoku Promotional Comprehensive Planning and the Kitakami River Dyke Planning, Senshio Industrial Belt Planning, Hachirogata Reclamation Planning were carried out.

Among these, the most important issue was the Kitakami River Upper Stream Power Plant Planning which was raised in connection to the Internal Affairs Ministry.

In other words, as far as the dam for power generation was concerned, 4 sites, the Shijushida, Sawauchi of the Waga River, Tase of the Sarugaishi River and the Ishibuchi of the Izawa River were raised as issues, reservoirs were to be built and power generation were to be coordinated with flood control. This idea was conceived by Masayuki Kanamori of the Tohoku Branch of Internal Affairs Ministry and represents the origin of the linkage of power development and reservoir works.

River technicians and engineers of those days were inspired by the enormous dams built by TVA and although the scale in Japan is small, the dubbing of Japan's TVA shows the burning zeal in the Kitakami River Dam Planning.

In 1940, a site survey was conducted by the staff of the Civil Engineering Bureau, after which 5 sites — Shibusani Dam on the Kitakami River, Goshō Dam in the Shizukishi tributary, Yuda Dam on the Waga tributary, Tase Dam on the Sarugishi tributary and Ishibuchi Dam on the Izawa tributary — were designated. This formed the base for today's 5 dams along the Kitakami River.

Later, under a war economy, in order to create a self-sufficiency in high-octane gasoline used in aviation, the need for power necessitated the location of a plant at Ofunato. Plans were set up to supply power from the Tase Dam and the Kitakami Dam and enormous repair costs were allotted. Work started on the Tase dam but the termination of the Pacific War brought the dam works to a halt.

After the war in September 1947, Typhoon Kathleen brought floods to the whole country and in November that year, the Water Storage Investigation Committee was set up with the Construction Minister as the Chairman. Since Kitakami River suffered the heaviest overflow, it was raised as one of the basins under study.

In September the following year, Typhoon Ayon brought a major flood and again large damages were incurred. As a result, the presentation of revision plans were hastened and finally passed in February 1949.

Consequently, the Economic Stability Headquarters selected the Kitakami River as a basin requiring development of water storage, power generation, irrigation and water supply and from 1948-1949, the Construction Ministry conducted a survey after which the Kitakami C. D. P. was completed.

This plan fundamentally changes the previous Kitakami River Upper Stream Improvement Planning and the 5 large dams planning. In this plan, the maximum water discharge of 9000 m³/sec was reduced to 7000 m³/sec and a maximum of 13000 kW pf power and water necessary for irrigating 3565 ha. of land was supplied.

At the same time investigation on the planning of water storage and supply in the Kitakami River system in Miyazaki Prefecture was carried out. The Naruko Dam on the Eai River, Hanayama Dam and the Kurigoma Dam on the Hazawa

River were built for flood control, power generation, irrigation and water supply.

In 1950, the Kitakami River Basin was raised as a case of the Special Regions C. D. P. by the enactment of the National Land Comprehensive Development Act.

The Kitakami River Basin spread its projects to other prefectures, Iwate and Miyazaki, covering a total of 12,600 km².

Development of this area emphasises the provision of infrastructure for flood prevention of the Basin, the functional utilization of the various resources and the promotion of mining industries based on the region's resources.

In order to achieve this, the 5 dams of Kitakami River — Naruko, Hanayama, Kurigoma, Gando, Toyozawa and Sannokai — various works were to be supplemented to the dams and through these works 8,600 chobu (1 chobu=10 km²) of irrigation and drainage works and 3,000 chobu of cultivation and reclamation works will increase rice production by 500,000 koku (1 koku=4.96 bushels). Each dam will be further used to generate a maximum 150,000 kW of electricity of local mining industries.

The preservation of public lands was to be done through reforestation of 5,000 chobu along the Kitakami Basin.

Great expectations were held by residents for this region as this Special Region produced a maximum output of 35,000 kW of electricity and 2,275,000 koku of rice.

These expectations rested on the remarkable achievement as follows:—

- (1) Kitakami River 5 dams
Completion of 5 dams — Ishibuchi, Tase, Yuda, Shijushida and Gosho.
- (2) Old Kitakami River dams
Completion of dams — Hanayama, Naruko, Kurigoma
- (3) Dams for irrigation
Completion of dams — Sannokai, Toyazawa, Iwaguchi
- (4) Fire prevention dams
Completion of Tono Dam, partial completion of Gosho fire prevention dams and Koromogawa fire prevention dams.
- (5) Multipurpose dams connected with irrigation and drainage works.
 - a) Completion of Izawa cultivation and construction works (connected to Ishibuchi River Dam), cultivated rice fields 950 ha. old fields water supplement 6,123 ha, cultivated fields 512 ha.
 - b) Completion of Sarugaishi cultivation and construction works (connected to Tase Dam), cultivated rice fields 3,301 ha., old fields water supplement 2,969 ha, cultivated fields 1,216 ha.
 - c) Completion of central Waga cultivation and construction works (connected to Yuda Dam), cultivated rice fields 3,890 ha., old fields water supplement 337 ha.
 - d) Irrigation works connected with old Kitakami River dam

The Ozaki Dam is supplying water to 9,618 ha of old ricefields in the Ozaki Plains, the Hanayama Dam to 8,844.5 ha of old rice fields around Tsukidate Town and the Kurigoma Dam to 4,859 ha of lod rice fields near Kannari Town.

- (6) Dams connected to power generation works

Completion of the Ishibuchi, Tase, Yuda, Shijushida, Naruko, Hanayama and Gando Dams connected to 10 power stations will supply 184,000 kW.

These development works indeed demonstrated remarkable progress in dam construction, power generation dams and multipurpose irrigation dams. However, in contrary to this, the development of roads, ports, rail and urban planning lagged behind.

The earnestness put into the development of the Kirakami Special Region has earned it the name of Japan's TVA, but when considering the basic principles of the TVA, the former concentrates too much on dam-related works while regarding TVA as only a riverrelated infrastructural project.

In other words, the fundamental principles of TVA do not stop at just the dam-related works but are oriented towards the overall unified development of man and resources in the valley through the establishment of the autonomous TVA Corporation and other related bodies and the decentralization of powers in the hands of respective districts, while the projects in each district are implemented through the interdisciplinary cooperation of professionals and experts from various fields. Most fundamental of all it engages the participation of local inhabitants in various projects and plans bringing home the underlying principle of grassroots democracy.

Therefore, when considering the transfer of the TVA principles into Japan, the fundamental ideas are in fact not fully understood. This suggests that sufficient reflection must be taken in order to establish regional planning in Japan.

4. The Transfer of Regional Sociology⁷⁾

As heretofore discussed, the so-called TVA of Japan, the Kitakami Special Region Comprehensive Development in fact do not sufficiently take into consideration and practice the fundamental ideas of regional development, that is the integrative development characterised by the unity of man and resources, and the view of the region as a regional society within an active general structure, this being generated by autonomous participation of local inhabitants and decentralised authority system.

One of the earliest scholars to have indicated this point was Kiyohide Seki.

Seki moved from the Internal Affairs Ministry to the Economic Stability Headquarters where he was involved in research on national land planning and policies. He became attached to Hokkaido University and from 1953 has been conducting surveys on regional sociology in Hokkaido.

By tracing the lineage of regional development planning in the U. S. and regional sociological research orientations, he analysed how the inter-relations phenomena of human living was reflected within limits in actual regional living and theoretically and consistently grasp the social interactions of complexly developed inter-communities.

After setting up urban and rural social frameworks, he came up with the unified regional society born out of village social interaction and worked towards

analysing their structure and function.

Seki was the first to present the regionalism thesis found in the history of regional planning in the U. S. while the sociologist who theorized on the concept of a planning region was Odum.

Odum was engaged for a long time as chief professor at the Sociology Department at the University of North Carolina where he was involved in research on society and culture of the American South. While simultaneously supervising a large number of researchers he became editor of *Social Forces*, exerting a strong influence on the American Sociological Society. During the 1930's, he participated in administration in the Federal Government as a responsible member of the Social Trends Research Committee of the U. S., and later took up the practical activities of the TVA and others.

Odum describes regionalism in the following 4 points. The first is regionalism as a science. From the various fields of geography, ecology, biology, history, economics, sociology, etc., natural sciences and social sciences, basic research must be conducted on the inter-functional relationships concerning man and resources, region and culture, physical environment and cultural environment, etc and the collected data analysed, interpreted and used and through this "region" that allows for the cooperation and arrangement of the above sciences must be selected. Regionalism is, consequently, an integrated science. The second is regionalism as America's frontier. The early period of America's development was as its name implies, a natural frontier. However, the new frontier of today must be a frontier with a social and cultural meaning. Early frontier involved the exploitation and conquest of nature but new frontier means the development and conservation of nature. Consequently, a planning region calls for a region that can discover a new balance and equilibrium through the redistribution of population, wealth and opportunity.

The third is regionalism as a means and technique of administration. Regional development encourages decentralization and moreover since development planning, temporally and spatially, is flexible in character, development administration demands a special technique. Regionalism is an answer to this. Therefore, a planning region must correspond to this technique.

The fourth is regionalism as a motive and goal. Development planning must activate the region's growth and stimulate their desires to positively participate in development activities. Due to this very fact, democratic ideas must first be realised, and this requirement is found in regionalism itself.

These are the 4 points on regionalism by Odum. The region that he conceived as the object of regional planning ultimately as a component part of the nation and the regions have neither competition nor dissension between them. He asserted that development planning together with the goal of the region's inhabitants welfare as do contributes to the prosperity of the U. S., so the Federal Government should grant leadership, equity subsidies, scientific research, expert guidance, research grants, technology and personal interaction to each region. In this way, Odum viewed the region as a whole society.

Seki after a long period of research on the region of Hokkaido presents the following view on regional interrelations.

“The urban region and external view may resemble each other, but is, in essence, completely different. The urban community is equal to the rural community. The periphery is not dependent on the core. The relation between both is that they function as one. And taking the regional society as a base, human living interrelations takes on a relatively collected expression. This very view sees the regional as a living reality. As mentioned before, in the field of sociology, rural sociology and urban sociology are the only existing schools of thought on communal society. Rural sociology, in the main analyses the internal social structure of villages while urban sociology does nothing more than look at the internal structure of the city itself or the core of supercities and secondarily, its periphery. However, a realistic society in a one nation society is found in a region that encompasses both the urban and rural parts. Moreover, the urban and rural regions do not exist as isolated, independent entities but are interdependent, complementary and functionally unified. This very unity presents the social region and in sociological terms a regional community, in the real sense of the word “society”. The terms rural community and urban community and the establishment of regional society that centers on this concept should not be impossible. The meaning if regional society here is a single general whole society. As the concept of this general whole is vague and methods of scientific analysis find hard to clarify, this regional society has never been taken as the focus of study. However, I think that this sociology, focusing the regional society should be called sociology in the real sense of the word. The general understanding of social living that in fact characterises sociology can be explained through this view.”

Seki's concepts on regional sociology express 3 basic problems.

- (1) that the study of regional sociology focuses on the interrelation region of urban-rural integrated and single unified regional society.
- (2) that regional sociology is the study of the structure and function of the interrelation region.
- (3) that regional sociology rationally distributes the population, industry and culture of the interrelation region and while examining the reorganization of the region, to discover the methods of regional planning for that purpose.

Thus, in the way, Seki led the way in establishing regional Sociology in Japan based on the understanding of regionalism by Odum that provided the foundation of TVA.

Today, the need for community participation has been raised in the concept of community, but the basic theory of regional society is well-considered and established in actual regional planning.

5. Conclusion

In this paper, we introduced the historical development of TVA and the fundamental concepts of its comprehensive development. Thereafter, with reference to

the Kitakami Comprehensive Development Planning case, the transfer and transformation of these ideas into Japan's river basins will be described. Finally, the subject of regional society, a vital issue in Japan's regional planning, will be discussed.

The main results are as follows.

1) In connection to New Deal Policy, the TVA came into being. The execution of positive comprehensive projects by the government was met just only the eradication of depression starting with the unemployment problem, but with the government's own participation in the power industry. The controlling of electricity prices as an anti-monopoly measure against electricity enterprises who play an essential role among American monopoly enterprises, is of great significance. In March 1933, President Roosevelt sent a message to the Congress, presented the Norris bill to the Upper House, the Hill bill to the Lower House and in May the same year, the TVA Corporation Act was ensigned and officially inaugurated.

2) In the TVA Valley today, 500,000 ha have been reforested, soil erosion prevention is progressing, forest fires are reduced, wild animals have increased, accumulated forest is more than twice of that 40 years ago and its growth is more than three times its deforestation. As a result, population engaged in forestry and forestry processing industry has reached more than 50,000. In these conditions, forests in the valley endeavors towards solving the integrated issues of water resources, landscape, forestry and forest recreation.

3) According to the Tennessee Valley Development Corporation Act, the TVA holds full responsibility concerning the development and conservation of the Tennessee River, and attempts as far as possible to improve the welfare of the inhabitants. In the implementation of the plans, extensive pre- and post- surveys are conducted using methods which rival those of the environment assessment of today. In the development of the Valley, it also holds the all-round responsibility of planning a comprehensive, unified social and physical environment and ensuring its implementation, not only for power development but for the improvement of the general welfare of inhabitants.

4) One of the principles of TVA is unity of men and resources. In administering a project of such broad scope, the TVA inevitably calls for men in various technical fields resulting in high degree of specialization. The scope of the TVA covers the entire scope of natural and social environment. Therefore, the TVA Board exchanges views with the professionals and experts, introducing specialized views on wider public interests — the welfare of the valley inhabitants. The unifies development of resources must become the common purpose of all the people and all the agencies of the entire valley.

5) The special feature of TVA originates in modern democracy, that is the full participation of the region's inhabitants through democracy at the grassroots. Lilienthal describes its necessity in the following way.

“A method of organizing the modern task of resource development that not only will be based upon the principle of unity but can draw in the average man

and make him a part of the great job of our time, in the day-to-day work in the fields and factories and the offices of business, will tap riches of human talent that are beyond the reach of any highly centralized dictatorial and impersonal system of development based upon remote control in the hands of a business, a technical or a political elite. It is just such a widespread and intimate participation of the people in the development of their valley that has gone on in the Tennessee Valley.”

6) The Congress established the TVA as a national agency, but one confined to a particular region. This provided an opportunity for decentralization. A limited region, its outlines drawn by its natural resources and cohesion of its human interests, was the unit of federal activity rather than the whole region. To the degree that the TVA experiment serves the decentralization interests history may mark that down as TVA's most substantial contribution towards national well-being and the strengthening of democracy. To make it possible for citizens of the regions concerned to hold decision-making power and participate positively in TVA, TVA's headquarters was established not in Washington but in Knoxville. The realities of the regions were well understood by those who implemented TVA projects and would seek for permits from the central government when prohibited from implementing responsible. Consequently, department and district administrators and site staff of TVA were selected, trained and entrusted with wide responsibilities and free discretion powers.

7) The earnestness put into the development of the Kitakami Special Region has earned it the name of Japan's TVA, but when considering the basic principles of the TVA, the former concentrates too much on dam-related works while regarding TVA as only a river-related infrastructural project. Therefore, when considering the transfer of the TVA principles into Japan, the fundamental ideas are in fact not fully understood.

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