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Regional Initiatives and Operations of ICT Service Companies in Dehradun, the Capital City of Uttarakhand*

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Abstract This paper takes a close look at the factors that led to the expansion of India's ICT service industry into second- and third-tier cities in northern India. The following two points will be considered. The first is regarding the industrial development policies for the ICT service industry by the Uttarakhand state government. The second is the actual operations of ICT service companies located in Dehradun. Examination of these points will clarify a facet of the current conditions of industry development within the spatial structure of northern India, which have relatively monopole concentration to the National Capital Region of Delhi, as well as uncover new issues that manifested under the state's autonomy with industrial developments.

Key words industrial policy, state government, non-metropolitan region, spatial expansion, location strategy

I. Introduction

In a global competitive environment, the multinational corporations and the financial institutions in OECD countries have externalized their noncompetitive works to non-OECD countries. Not only the outsourcing of manufacturing operations, which are contracted out to the Electronics Manufacturing Services (EMS) but also service processes, such as software programing, data server maintenance, payroll, accounting, and claims processing, are outsourced to IT service and BPO companies (Gereffi, 2006).

Information and Communication Technology (ICT) has made it possible to relocate business operations from OECD countries to India and exploit lower operating costs and obtain capable human resources for competitively providing the services from India. In addition, it is apparently significant that the Indian government has intervened widely to influence the development of export-oriented Indian ICT industries rather than domestic markets (Heeks, 1996). Since the ICT industry was in its infancy, resources in private capital and an understanding of the needs of entrepreneurships were limited. Nevertheless, the availability of skilled labor witnessed the emergence of an export industry, with body shopping as the dominant means of organizing production (Parthasarathy, 2004).

From the geographical viewpoint, an army of skilled labor can be utilized in the metropolises or the first-tier cities of India. For this reason, the ICT industries have agglomerated in the metropolises and exported their services to OECD countries (Kuwatsuka and Kitagawa, 2008). Bangalore, known as the "Silicon Valley of India," has received much attention as a vibrant place for these industries. There are many studies that considered the industrial structure, historical development process, and the agglomeration economy, and it has been pointed out the critical role of the state government's industrial policy (Parthasarathy, 2004; Heitzman, 2004).

Mumbai, Chennai, and Hyderabad are also destinations of the industry. However, focusing only on the metropolises provides not only an incomplete picture of the ICT service industry but also a limited understanding of the spatial structure of India. The original growth of the ICT service industry in India was achieved through offering outsourced work at a lower cost than OECD countries. Because of this, the ICT service industry is sensitive to cost advantage. Herein lies one reason why the industry must undertake expansion to provincial cities. This means that the ICT service industry in India, after having achieved growth based on international disparities with OECD countries, must now attempt to achieve further growth through the use of regional disparities that exist domestically (Kuwatsuka, 2013).

The industry is located not only in the metropolises and southern part of India but also has expanded into the second- and third-tier cities and the northern part of

*This paper is based on published articles in Japanese (Kuwatsuka, 2012, 2014).

India as well. Therefore, when attempting to understand the growth of the ICT service industry and its impact on India's spatial structure from the perspective of geography, discussions should focus not only on the metropolises but also on provincial cities as well.

Moreover, it is impossible to ignore the deep relation between the industrial location and the development policies implemented in economically backward states. This is because within the federal system of India, state governments exert powerful authority regarding industrial development, and their efforts play a role in directing the location of the industry. Furthermore, amid similar industrial development policies from multiple state governments, companies that intend on relocating their operations are able to weigh the activities of each state government when selecting locations.

Such trends are also seen in Dehradun, the state capital of Uttarakhand, in the northern part of India, which separated from Uttara Pradesh in 2000. As a new state, Uttarakhand was able to independently devise industrial policy by its own legislative power. As a result, it became possible to introduce efforts as a state government to entice industries to expand from the National Capital Region or the Delhi metropolitan area. However, there were also several bottlenecks that surfaced to prevent the full incorporation of the metropolises' growth into the region. Whether or not the growth of the ICT service industry throughout India could be tied to the development within the state was largely impacted by the ability to formulate and implement policies of the state government.

The above issues have been discussed in Kuwatsuka (2013); however, the detailed consideration of the initiatives of the state government and operations of the ICT service companies in Dehradun has not yet been reported. This paper will first examine the factors that led to the expansion of India's ICT service industry into provincial cities. Then, our consideration will be placed on the following two points. The first is regarding the industrial development policies for the ICT service industry by the Uttarakhand state government. The second is the actual operation of ICT service companies located in Dehradun. Examination of these points will clarify the current conditions of the industry development in Uttarakhand as well as uncover new issues that have manifested under its autonomy.

II. Spatial Expansion of the ICT Service Industry in Northern India

The way that spatial structure has been previously created by the industry cannot be ignored when seeking to understand behavior related to determining the location of the ICT service industry. Furthermore, when viewing the distribution of the ICT service industry, the spatial structure differs largely between northern and southern India.

These differences in spatial structure can be confirmed by ICT service export values by state and union territory (Table 1). First, the state with the largest export value (US $39.7 billion) is Karnataka with Bangalore as its capital city, which accounts for 37.1% of India's total export value. Second is Tamil Nadu, with the Chennai and Maharashtra large-scale concentrated areas of Mumbai and Pune, which accounts for 13.8% of export value. These are followed by Telengana with Hiderabad (12.1%). These states alone, with the exception of Maharashtra in the south of India, account for approximately 63.1% of India's entire exports, or approximately 76.9% with the addition of Maharashtra. These figures confirm the predominance of exports from India's southern states.

The states with the largest export values are those in which large-scale concentrations of ICT service industries have been formulated. For example, in the case of Karnataka, approximately 95% of office locations of software companies within the state are located in Bangalore (Kuwatsuka, 2006), which indicates a spatial structure of extreme concentration within the state. If a company seeks to diversify their location from the state capital for the purpose of reducing costs, then it must establish

Table 1. Export value of ICT service 2015/16

Rank	State/UT	US$ Mil.	%
1	Karnataka	39,731	37.1
2	Tamil Nadu	14,823	13.8
2	Maharashtra	14,823	13.8
4	Telengana	12,989	12.1
5	Haryana	7,641	7.1
6	Uttar Pradesh	5,348	5.0
7	Kerala	2,751	2.6
8	West Bengal	2,139	2.0
9	Andhra Pradesh	1,528	1.4
10	Delhi	1,375	1.3
	Others	3,902	3.6
Total		107,050	100.0

Source: ESC (2017, p. 18)

offices in provincial cities within its own or neighboring states. This is because; it would be difficult to achieve the goal of reducing costs by moving to large-scale concentration areas in state capitals of neighboring states.

In contrast, northern India has an extreme concentration in the National Capital Region, or Delhi metropolitan area. The spatial structure of the ICT industry in northern India is different from southern India, which has large agglomerations in their respective state capitals. When examining the export value by state and union territory, Haryana and Uttar Pradesh have the largest values. The substantial portion of "exports" from these two states can be regarded as coming from the National Capital Region of Delhi. This is because the ICT service business in Haryana is located exclusively in Gurgaon (on the outskirts of Delhi) and similarly in Noida in the state of Uttar Pradesh. Therefore, exports from Haryana and Uttar Pradesh can be viewed as exports from the National Capital Region. The combined export value from these three states is US $14.4 billion, which is on a similar scale with Tamil Nadu and Maharashtra, accounting for 13.4% of the total.

When comparing the values with areas outside of the National Capital Region of Delhi, there are many states with relatively low values of export. In northern India, the industry is clearly predominant in the National Capital Region, which is surrounded by the relatively backward states. The ICT service industry in northern India has a spatial structure that is extremely concentrated in the National Capital Region and has different aspects than southern India, where large agglomerations are formed in the respective state capitals. These differences in spatial structure actually draw the ICT service industry from the first-tier cities to the second- and third-tier cities. In the case of northern India, where large-scale concentrated areas are formed only in the National Capital Region, companies can take advantage of institutional differences in industrial policies by crossing state borders. Furthermore, business can be established in economically backward states because the cost of operations is relatively low. This type of spatial structure in northern India is conducive to the spatial expansion of the ICT service industry to underdeveloped states.

By keeping these factors in mind while viewing the export value of ICT services in northern India, the growth of the industry in areas outside of the National Capital Region of Delhi can be verified, albeit on a relatively small scale (Figure 1). In spite of having the second largest value of exports next to Delhi, the export value from Rajasthan was only US $9.4 million in fiscal 2001. The value had increased to US $688 million by 2015. The export values of Chandigarh, Punjab, and Madhya Pradesh had simi-

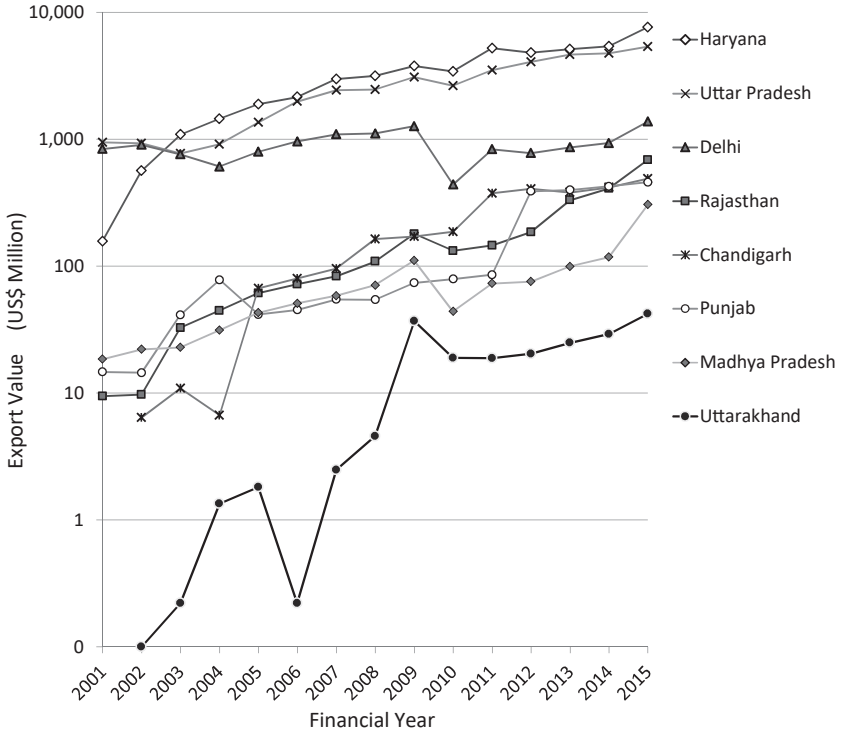

Figure 1. Export value of ICT services from North India
Note: Jammu & Kashimir and Himachal Pradesh are omited. Export value of these states are under 10 million in 2015.
Source: "ESC Statistical Yearbook" various year.

larly increased. Such trends represent a reduction in the share of the National Capital Region. The ratio of export value from the National Capital Region (total of Haryana, Uttar Pradesh, and Delhi) was 97.9% of the export value from all of northern India as of 2001. This ratio fell to 87.8% in 2015. Hence, it can be inferred that the ICT service industry grew in other states and union territory while there was little change to the predominant scale of the National Capital Region.

Amid these trends of expanding exports from areas outside of the National Capital Region of Delhi, one of the most noteworthy is Uttarakhand. The export value from this state was a mere US $0.1 million as of 2002. By 2015, the value had increased to US $42.0 million. While this value represented only 0.3% of the export value from northern India, judging from statistics obtained in 2004, the export value had increased 31-fold by the year 2015, a growth rate that overwhelmed other states. While the scale is still relatively small, Uttarakhand is one of the states that experienced rapid growth of the ICT service industry in northern India in the first decade of the 21st century. The fast growth in this economically backward state is attributed to the active behavior of both the companies and the governments. The ICT companies dispersed their operations from the National Capital Region with the intent of reducing operational costs. The central and state governments also put their efforts to promoting and inducing these companies.

There are existing studies on the development policy of the ICT service industry at the central government level (Heeks, 1996). In addition, it has already been discussed at the state level (e.g., Parthasarathy, 2004; Mascarenhas, 2010). However, there is still a dearth of research about northern India. The question that should be asked here is "How is state government autonomy with regard to industrial policy tied to the economic growth and development?"

The significance of focusing particularly on Uttarakhand is not simply due to rapid growth and its location in a non-metropolitan area of northern India. It is also important that Uttarakhand had obtained autonomy regarding industrial policy through its establishment as a new state. This viewpoint is significant to the study on the locational behavior of ICT service companies that have decentralized from the metropolises to expand their profits. Therefore, it is needed to consider the relation between the autonomous movements of state governments for industrial development and the behavior of ICT service companies who can evaluate some preferred location.

III. Initiatives of the State Government to Develop the ICT Service Industry in Uttarakhand

1. IT policy of Uttarakhand

Uttarakhand separated from Uttar Pradesh in November 2000 and was established as India's 27th state. Prior to separation, the area had been characterized by its economic underdevelopment and political dependency (Okahashi, 2014). Furthermore, Uttarakhand was treated as a "special category state" along with Himachal Pradesh and, thus, was eligible for preferential treatment for grant allocation and special industrial policies. In 2003, the "Uttaranchal and Himachal Industrial Policy" was implemented by the central government (Tomozawa, 2014).

In the same year, Uttarakhand established the "New Industrial Policy 2003" with the intention of creating new employment opportunities. Under the policy, the state government independently clarified 12 industrial fields for developmental focus from the 18 favored industries proposed by the central government and promoted it with fiscal incentives such as excise tax exemptions, corporate income tax exemptions, and capital investment subsidies. Here the ICT service industry was also targeted for industrial promotion. By separating from Uttar Pradesh in this manner, the independent state of Uttarakhand was able to maintain its own strategies for industrial promotion based on central government policy.

Located 200 kilometers directly northeast of Delhi, Dehradun has long been the location of central government research facilities and educational institutions. After becoming an independent state, the central government established an STPI (Software Technology Parks of India) office and provided telecommunications infrastructure and established satellite communication facilities in Dehradun, which became the provisional capital. The state government used the STPI facilities as a premise to promote the ICT service industry, including software development and call center operations, in the "New Industrial Policy 2003," along with handicrafts, horticultural products, tea, tourism, and biotechnology as policy targets.

However, the specific strategies demonstrated by state government were limited to development of "IT Parks" as industrial areas for office construction targeted for occupancy by ICT service companies, tax exemptions for land acquisition in the IT Park, provision of communications infrastructure with a maximum transfer rate of 2 Mbps, and specification of policies allowing three work shifts for females (assuming a 24-hour operation for companies establishing business there). The industrial promotional

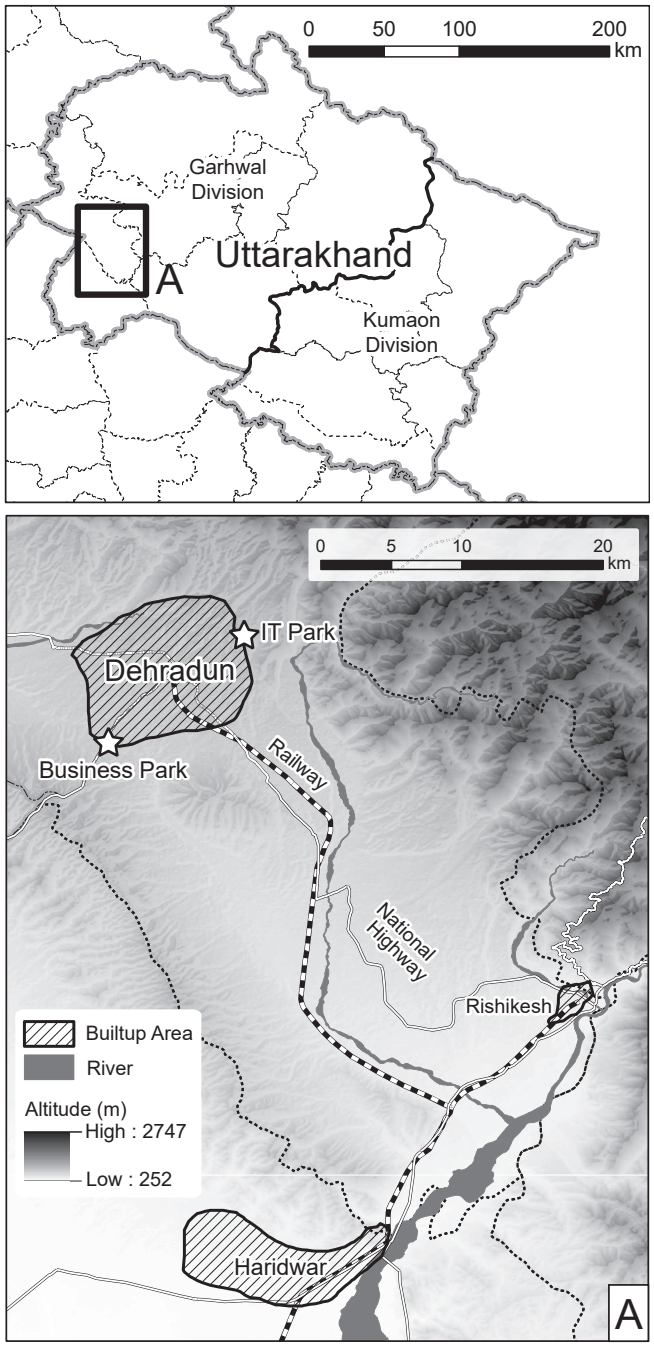

Figure 2. Location of IT Park and Business Park in Deheradun
Source: Kuwatsuka (2012)

policies in 2003 were focused exclusively on upgrading physical infrastructure without addressing the development of human resources essential to the growth of ICT service industries.

In 2006, the state government issued the "Information & Communication Technology Policy 2006." It set three goals, namely, to use information and communication technology to increase living standards, create employment in service sectors, and reduce social and regional divisions. Broadly speaking, this policy had the following two specific objects for realizing these goals. The first was the introduction of information communication technology and promotion of "E-governance" within government organizations. The second was the promotion of investment to ICT industries by the private sector and government support for such investment. In particular, the second goal was understood to be a renewed effort to stipulate the promotion of infrastructure upgrades to "attract" ICT service companies and investors based on policies clearly indicated by financial preferential treatment by the central government and in the "New Industrial Policy 2003," with a strong awareness of inviting companies from outside the state. In addition, more in-depth content, such as human resource development for employees in ICT service industries and promotion of educational programs to push such development, was contained in the "Information & Communication Technology Policy 2006." However, the human resource development, as referred to here, was primarily intended for improvements in basic computer literacy and not geared toward the training of software engineers, which was at a more advanced phase.

As the entity for promoting these policies, Uttarakhand established the ITDA (Information Technology Development Agency) in 2004 under the umbrella of the Department of Information Technology. However, ITDA was an agency for promoting E-governance and human resource development projects, and it did not proactively engage in the development or the promotion of the ICT service industry. Actually, the result was a system wherein each agency had achieved its mission; thus, the development of the "IT Park" was conducted by SIDCUL (State Industrial Development Corporation of Uttarakhand), and the provision of communication infrastructure was conducted by STPI. Therefore, there was no presence of vigorous agencies for the industrial development that strongly promoted the goals contained in the "Information & Communication Technology Policy 2006" in Uttarakhand.

Up to this point, the Uttarakhand state government was not able to establish a system for cooperatively promoting the industry while leveraging the policies of the central government. Although policies for the ICT service industry were presented, the state government had not arrived at the stage where it was creating an environment for attracting ICT service industry through "institutional thickness."

2. Development of IT Park in Dehradun

The fiscal incentives in the Information & Communication Technology Policy 2006 were based on industrial promotional policies established by the central government for the economically backward states. Therefore,

the short-term efforts of Uttarakhand state independently were solely limited to infrastructure developments, such as office parks for ICT service companies. Moreover, such developments undertaken by the state government actually lacked strong initiatives.

In 2006, the state government developed, through SIDCUL (the entity in charge of industrial land development), an office park on a site with an area of approximately 240,000 m² located around 6 km northeast of central Dehradun (Figure 3). It was named the "IT Park," and the allocation of land for companies wishing to move there began in June 2006. By September 2010, 20 companies had long-term lease agreements for land lots, which comprised approximately 20% of the total land area of the IT Park. The headquarters locations of the companies that obtained land from SIDCUL included 11 companies from Delhi and 5 companies from either Noida or greater Noida. That is to say, 16 of the 20 companies were from the National Capital Region of Delhi and had headquarters located in the outskirt of Delhi where ICT service companies are concentrated. Furthermore, from the "business" fields of companies' applications to SIDCUL when obtaining land, it was revealed that only five companies were involved in software development. In contrast, there were 14 companies (including those that also claimed software development field in their applications) that proposed their business fields as BPO (Business Process Outsourcing), such as call centers and back-office operations, in their applications (Kuwatsuka, 2013).

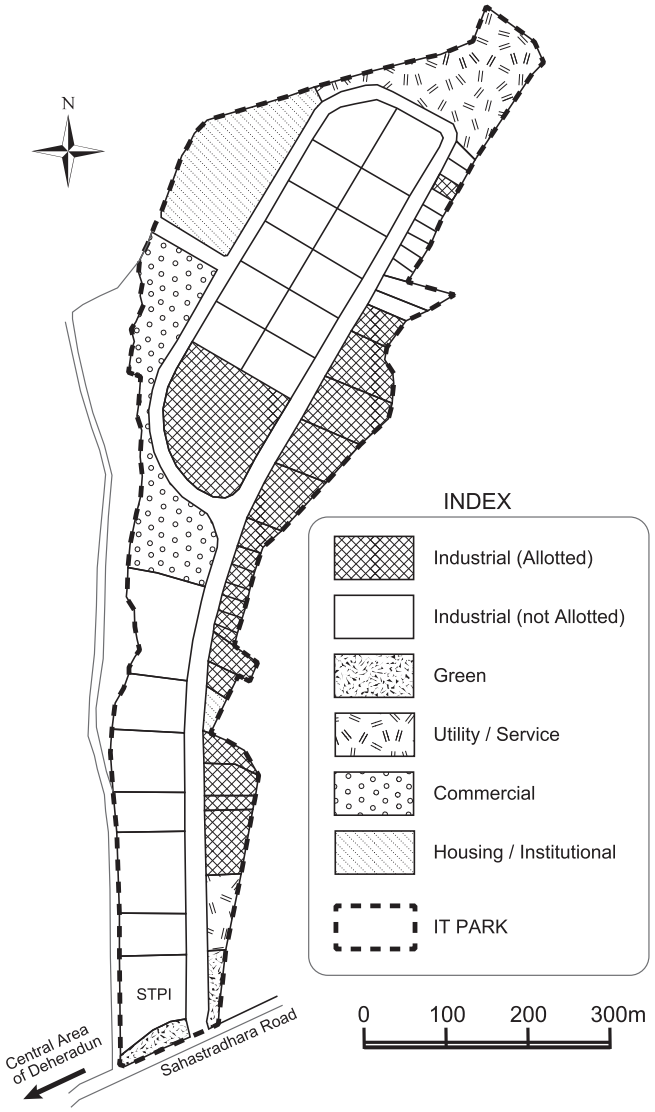

Figure 3. Layout Plan and Allotted Land lot of IT Park in 2010
Source: SIDCUL Office and SIIDCUL (2017)

Incidentally, the infrastructure supplied by SIDCUL in the IT Park was only roads, electricity, and public water, similar to other industrial parks developed in Uttarakhand by SIDCUL. Therefore, companies that acquired land needed to independently construct buildings, including offices, in the IT Park. Because of this, STPI built a small-scale incubation center within the IT Park in 2006 with the intention of promoting setting up new operations of the relocating companies and the local entrepreneurs through reducing initial investment in buildings and information communication facilities. The companies that had obtained a land lot in the park were also occupants of the STPI's incubation center.

In addition, the state government also tried its hand at constructing large-scale office buildings in the IT Park. In 2006, SIDCUL invested 49% for this purpose and established a consortium with private construction companies with headquarters in Bangalore, and started to construct their own office building in the same year. The use of this type of scheme where the state government invites private sector participation in development of infrastructure projects was also specified in the New Industrial Policy 2003, and this project proceeded based on this.

At first glance, the development of the IT Park by the state government, on the surface, seemed to be proceeding smoothly. However, despite being partially completed, the development of office buildings that the state government promoted with the IT Park was interrupted due to insufficient capital in July 2007.[1] Moreover, there were no companies that subsequently obtained new land up until February 2009, in spite of the fact that 13 companies had already obtained land in the IT Park by February 2007. By September 2010, there were only three companies that had constructed office buildings on obtained land and were able to be confirmed to be actually operating.[2] Although companies could receive fiscal incentives, by the time five years had passed since the Information & Communication Technology Policy 2006 was announced, full-scale opera-

tions in Dehradun's IT Park were not progressing.[3]

In spite of this inadequacy of the IT Park, relatively large business operations by ICT service companies were started in Dehradun. "Doon Express Business Park," which was established in 2006 at the same time as the IT Park, was another destination for the companies. This Business Park, around 6 km southwest of the center of Dehradun (Figure 2), was built and operated through an Indian company. It was established in Dehradun as a subsidiary of a company created in 1985 by natives of Dehradun who resided in the US state of Michigan. It constructed an office building equipped with a private power generator and their primary business is to lease floor space to occupant companies. In February 2006, the first building (two floors with a total floor space of 35,000 square feet) opened for business and, in September 2009, a building with approximately five times the overall floor space (five floors with a total floor space of 170,000 square feet) opened for business. As of September 2010, the three companies that were engaged in software development or BPO services began their operations in the first building, while a call center, hiring around 1,500 college graduates, began their business in the second building. One characteristic of the Indian company was that the business entity operating the Business Park not only undertook office duties such as human resources and payroll calculation for tenants, but also provided temporary staffing services.

In contrast to the state government's IT Park, companies occupying the Business Park operated by the private companies were able to reduce their initial costs of relocation and swiftly supply efficient supporting services for business operations. This indicates the importance of an organizational structure that supports starting business operation immediately at initial stage of relocation as well as expeditious upgrades to infrastructure including building facilities.

IV. Business Operations of ICT Service Companies in Dehradun

1. Business operations of STPI-registered business units

The export value of ICT services from Uttarakhand was only US $0.1 million in 2002. This value grew rapidly to US $1.81 million by 2005, US $18.75 million by 2011, and $42.02 million by 2015 (Figure 1). In particular, the large increase in the export value from 2008 to 2009, in spite of the global recession caused by the financial crisis culminating in the collapse of Lehman Brothers, was attributable to the start of full-scale operations in 2009 by ICT service companies that had spatially expanded in Dehradun. These were exclusively companies in the BPO sector doing call center operations and back-office work. Describing the business operations of ICT service companies in Dehradun is possible based on characteristics of companies registered with STPI in order to receive fiscal incentives.

The number of business units registered with STPI in Uttarakhand was 51 as of September 2010. According to Kuwatsuka (2013), approximately 60% of the units registered their operation in the BPO sector with STPI, which includes call center operations, back-office work, data entry, and CAD operations. In contrast, the units involved in software development accounted for a mere 30%. When viewing the locations of the 51 business units, all were located exclusively in Garhwal, the western division of Uttarakhand, with none located in the eastern division, Kumaon. However, while some were located in cities near Dehradun, such as Rishikesh and Haridwar (Figure 2), approximately 90% of the total had registered addresses in Dehradun. Hence, it is evident that even in Uttarakhand, the locations of ICT service companies were concentrated in the state capital of Dehradun.

Although registered with STPI, only 27 business units were actually exporting services based on the STPI's incentives. This is because they had just been established and were not fully involved in business activities such as exports. When viewing the time that each business unit became eligible for preferential treatment by STPI, there were 18 business units by 2006, with a particular concentration of 10 business units becoming eligible in 2007. It is evident that rather than starting operations immediately after the STPI was established in 2001 in Dehradun, businesses began operations after the state government presented the policy related to promotion and incentives for the ICT service industry in 2006. Many of the business units that actually export applied to STPI for business deployment in the BPO sector (19 out of 27 business units). The fact is that companies planning to deploy business operations in the BPO sector characterize Dehradun's ICT service industry (Kuwatsuka, 2012).

Incidentally, Dehradun's labor costs are at least 25% lower than labor costs in metropolises in India, and real estate costs are at least 55% lower (NASSCOM - A. T. Kearney, 2008). As a result of these lower costs, companies with locations in metropolitan areas, such as Delhi, can realize the benefits of expanding their business operations to Dehradun. On the other hand, the ability to sufficiently recruit excellent human resources locally is a precondition for spatial expansion of the ICT industry, which largely

defines its productivity by its human resources.

Regarding this point, of the 30,000 individuals who graduated from university in Uttarakhand in 2004, only 1,000 graduated in the field of engineering (NASSCOM - A. T. Kearney, 2008). Moreover, many of the students who studied computer science sought better benefits and experience and left Uttarakhand to find work with large ICT service companies such as Infosys and Wipro.[4] In contrast to software development, the BPO sector rarely demands specialized knowledge and capabilities such as with software development. Furthermore, a high degree of ability in English is not necessarily required for call center work targeted at the India market or simple CAD data creation work. Due in part to these reasons, compared with the software development sector, it was relatively easier for companies in the BPO sector to employ a large quantity of human resources in Dehradun who had received a higher education. This is because local operators employed by these companies were not strongly motivated to seek the same type of work in the Delhi metropolitan area due to the high cost of living.

As mentioned above, companies with locations in the National Capital Region of Delhi were particularly prone to expand business operations in the BPO sector due to factors such as relatively inexpensive labor costs and the ease of recruiting human resources. Finally, the business activity of ICT service companies spatially expanding into Dehradun will be verified based on interview surveys conducted locally.

2. Activities of spatially expanding companies and the positioning of Dehradun

Dehradun has become a desired location for ICT service companies seeking to reduce costs and grow by spatially expanding from the National Capital Region of Delhi. Table 2 presents a summary of operations for the 10 business units with which interview surveys were conducted at Dehradun's IT Park and Business Park. Five of the seven business units interviewed at the IT Park were occupants of the STPI's incubation center and three were from the Business Park. In regard to workforce size, the scale of business units conducting software development is relatively small compared with the BPO sector.

For example, Company A was established in 2008 and develops embedded software for mobile telephone accessory devices at the STPI incubation center in the IT Park. One of the founders is a native of Dehradun and had previously been involved in software development in Mumbai. Moreover, 15 employees of Company B have manufacturing companies in Uttarakhand as customers and, along with developing and maintaining application software, also develop websites for companies in

Table 2. Operations of ICT service companies in Dehradun

Company ID	Business Field	Operation	Year Established in Dehradun	Employee (Female)	Location in Dehradun	Location of Headquater/Parent Company
A	Software Development	Embedded software development for mobile telephone accessory devices	2008	3 (0)	IT Park	Dehradun
B	Software Development	Development and maintenance of application software for manufacturing companies in Uttarakhand	2008	15 (2)	IT Park	Dehradun
C	BPO	Outbound international call center operations and digital transformation of analog character information, website development	2006	60 (60%)	IT Park	Delhi (Noida)
D	BPO	Digitization of geographical data	2006	250 (35%)	Business Park	Delhi (Noida)
E	BPO	International call center operation of placement services (headhunting) for technology professionals inside and outside of India	2008	19 (4)	IT Park	London, UK
F	BPO	Digitization of geographical and geological data	2008	145 (18)	IT Park	Delhi (Okhla)
G	BPO	Domestic call center operations, customer services for the manufacture of home electric appliances	2008	900 (50%)	IT Park	Delhi (Noida)
H	BPO	Domestic customer support operations outsourced by the mobile network carriers	2009	1,500 (n.a.)	Business Park	Delhi (Gurgaon)
I	Others	Training service for software programing and development, supporting qualification certification	2007	n.a. (n.a)	IT Park	Delhi
J	Others	Property management of the Business Park, human resources and payroll calculation for tenants, and staffing services	2006	300 (n.a.)	Business Park	Michigan, US

Source: Kuwatsuka (2012)

the United States. Both companies were established in Dehradun.

The business units conducting business expansion in the BPO sector are relatively larger than companies in the software development sector and were established in Dehradun by companies with headquarters in regions outside of Uttarakhand. With headquarters in London, United Kingdom, Company E counts multinational companies such as Nokia, Ericsson, and Alcatel as clients and offers placement services (headhunting) for technology professionals inside and outside of India. With the exception of the person in charge of the business units, who is from Pune in western India, the operators who actually conduct placement by telephone are all MBA graduates from Dehradun with three or more years of work experience and high monthly salaries (20,000–40,000 rupees). Specialized knowledge is necessary in order to conduct headhunting for technology professionals as telephone calls are placed to selected candidates to persuade the candidates to change jobs. However, if the same human resources were to be employed in the National Capital Region of Delhi, the monthly salary range would be 30,000–60,000 rupees. Hence, the benefit of spatially expanding to Dehradun is achieved through reduced salaries.

Larger scale business units are companies in the BPO sector that conduct standardized work tasks. Company D and Company F conduct digitalization of geographical information in Dehradun. The business unit of Company D, with headquarters in Delhi (Noida), was established in 2006. The company conducts business related to geographical data, including GIS data, and has another location in Hyderabad in southern India. This company employs graduates from engineering collages within Uttarakhand and also incorporates a 24-hour, three-shift employment system depending on the work content.[5] Ninety-five percent of the workforce is from Uttarakhand and the average age is 24–25-years-old. Although female employees comprise 35% of the 250 employees, female employees do not work the night shifts. It is said that this is because there are many females who dislike the night shift. Costs associated with operations (including labor costs) are about 60% cheaper than the National Capital Region of Delhi, which is one major attraction for relocation to this area.

Likewise, Company F, which also digitizes geographical information, has its headquarters in Okhla (in the southern section of Delhi) and has established branches not only in India (Delhi, Hyderabad, Chennai, Ludhiana, and Dehradun), but also in the United States and Dubai. The business unit in Dehradun performs the work of transforming geological data sent from the United States as image data in TIF format into vector data. While the regular work is standardized based on a manual, prior to commencing business operations in Dehradun, the work was first started in Delhi with only 20 employees and then moved to Dehradun two months later. Therefore, all experienced manager-level personnel were transferred from Delhi. This is because the company is currently unable to hire human resources in Dehradun that have experience managing projects. In contrast, the operators who are actually engaged in the work are hired locally as degree-holding graduates, many of whom are from Dehradun. However, even though monthly salaries may increase based on capability after employment, they are lower than at Company E. Moreover, similar to Company D, Company F also utilizes three shifts over 24 hours. However, night shifts are not staffed by females as doing so could hinder the guarantee of excellent human resources.

In this way, the manager-level employees are sent to Dehradun from the National Capital Region of Delhi while operator jobs are filled by employing local people that represent a relatively lower cost of labor. Dehradun's structure of ICT service industries commencing growth under the strong influence of National Capital Region began in earnest in 2009.

These same characteristics can also be found in business units that conduct call center operations. With headquarters in Noida (Delhi metropolitan area), Company C is a BPO company of 60 employees and an occupant of the STPI incubation center in the IT Park of Dehradun since 2006 that conducts international call center operations and digital transformation of analog character information. Sixty percent of the employees are female, which is a relatively higher ratio than other companies. Because telemarketing sales uses English over the telephone to solicit from the business unit in Dehradun to individuals in the United States, the United Kingdom, and the Philippines for the purpose of selling products, call center operations require degree-holding and English-speaking graduates. Operations targeted to the United States are conducted from 8 PM until 5 AM India time, whereas operations targeted to the United Kingdom take place from 3 PM until midnight. Because of these time slots, the work is organized so that females also staff the night shifts. In such cases, however, the company provides a car with security personnel to take the female employees to and from work. Many of the employees are from Dehradun. After undergoing English accent training for two to three weeks after employment, the employees undergo

work process training for an additional two weeks. In contrast, individuals employed as managers have a total of 8–9 years of call center experience in Gurgaon, Delhi, or Chandigarh. Because the ICT service industry itself is newly established in Dehradun, it is difficult to employ this type of human resources locally. Therefore, there are also situations when operators with experience working in the Delhi metropolitan area are also employed for the operations of international call centers.

However, there are also situations where educational background does not necessarily require a degree. In business units that conduct call center operations targeted domestically, there are personnel in charge who state that "good communication skills are required." Company G and Company H conduct call center operations in Dehradun that are targeted domestically in India. With headquarters in the Gurgaon, Delhi metropolitan area and an occupant of the Business Park, Company H contracts mobile phone (the number of users of which has exploded growth in India) customer support operations from various mobile network carriers. Because the company had just begun hiring operators after beginning operations in September 2009, there were only 100 employees. However, this number had increased to 1,500 employees by September 2010. In the case of call centers targeted domestically to India, the operators need only speak Hindi and simple English, which requires an educational background of completion of secondary education or above. A Delhi company, Company G, is also a call center and was established in 2008. Company G contracts customer support operations targeted domestically from the manufacturers of home electrical appliances in India. Because this particular center is responsible for northern India, it employs operators who can speak Hindi and Punjabi. As such, the operators do not necessarily have to be degree-holders.

Hence, it is evident that common reasons for each company in the BPO sector to spatially expand to Dehradun were relatively low labor and real estate costs compared with the National Capital Region of Delhi. Tax incentives from the state are also part of the equation. Moreover, it is evident that business deployment maintains strong ties with the National Capital Region as manager-level employees were sent from the National Capital Region. Some of the personnel in charge that responded to the interview indicated that the lifestyle environment of Dehradun is better than the National Capital Region. Although this is not the perception of local operators, but rather the perception of the manager-level employees with employment experience in the metropolises, it clearly shows that external diseconomies of large cities represent one reason for promoting decentralization. It goes without saying that the ability to reduce costs associated with labor and real estate form the foundation of decisions to migrate. The ICT service companies that were based in the metropolises have deployed their business operation to Dehradun as a strategic location for reducing their operating costs.

V. Conclusion

This paper examined the ICT service industry, which has recently embarked on expansion from India's metropolitan areas to regional cities. While particular attention was placed on industrial promotion and incentive efforts by the Uttarakhand state government, which emerged as a new state in 2000, the activities of ICT service companies spatially expanding to the state capital of Dehradun were also examined. Faced with a new competitive environment, it is evident that the ICT service industry attempted to grow by proactively taking advantage of regional disparities between Dehradun and the National Capital Region of Delhi.

The research results show that although the state government has a certain institutional autonomy, it was unable to expeditiously execute planned policies and its efforts toward promotion and incentives for ICT service industry fell short. Hence, the status of Dehradun remains merely as a recipient of decentralization of the industry from the National Capital Region of Delhi. While possessing the autonomy for promotion and incentives for the ICT service industry, there is a facet of the administrative autonomy of Uttarakhand that has led to its economic dependency on the National Capital Region.

Hidden within this relationship are potential bottlenecks to the growth of the industry in Uttarakhand that are related to the capability held by each actor. One potential bottleneck is the perceived weakness of the industry policy and lack of practical know-how. Another is the peripheral role of the business units of ICT companies located in Dehradun regarding the division of labor between regions within the company. With regard to either of these potential bottlenecks, further research is required to assess if the ICT service companies located in Uttarakhand will be able to maintain sustainable growth. It should be answering questions of how the industry will be able to improve capability in the regions within an internationally competitive environment and how the industry will forge connections with regional actors.

The spatial expansion of the ICT service industry into Uttarakhand is at a stage where the BPO sector, e.g., call

centers, has begun to start low cost operations in the state capital of Dehradun. As pointed out in Kuwatsuka (2013), careful monitoring of the behaviors of state government and trends of the industry is needed to consider if the role of the city will be limited to a mere "telephone stand that has been additionally set up" by companies aiming to expand business and reduce costs, or if the status of a business hub will be established through the assumption of responsibilities for independent functions.

Note

1. Supreme Audit Institution of India, Comptroller and Auditor General of India, Chapter 3 Industrial Development Department in "Report of 2010—Performance Audit on Civil of Government of Uttarakhand" p. 111 (http://saiindia.gov.in/sites/default/files/audit_report_files/Uttarakhand_Civil_2010_Chapter_3.pdf), accessed June 3rd, 2017.
2. Confirmed by the fieldworks and interviews to managers of the companies by the author.
3. According to the SIIDCUL Website, 20 companies had been acquired the land plot from SIIDCUL since Oct. 2010. However, half of those were the financial institutions and agency of state government that were allotted relatively large plots. The remaining 10 companies engaged in the software development or BPO operations were allotted small plots (SIIDCLE "List of Allottee of Industrial Estate—IT Park", No date, https://www.siidcul.com/upload/industrialEstate/LOA_ITPARK1442649589.pdf), accessed June 3rd, 2017.
4. Based on an author's interview with personnel placement professionals working for a local private university in Dehradun. The campus interviews were held by the companies locating their headquarters in the metropolises.
5. The company has hired degree-holders, e.g., bachelor of computer applications (BCA), bachelor of engineering (BE), and bachelor of technology (B.Tech).

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