# Chapter 4

# Prototype Models of the Flowchart Approach to the Industrial Cluster Policy

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# Chapter 4

# PROTOTYPE MODELS OF THE FLOWCHART APPROACH TO THE INDUSTRIAL CLUSTER POLICY

*Akifumi Kuchiki*

Abstract

This chapter assumes the policy process to form industrial clusters. First, a local government establishes an industrial zone to attract foreign investors. Second, the government builds capacity for improving the business and living conditions of foreign investors. If physical infrastructure such as road, ports, communications improve and human resource is available, the government can invite "anchor firm", which has high value of the backward linkage in manufacturing. If anchor firm set up a factory, agglomerations will be accelerated. CLMV countries are in the stage to improve the business and living conditions of foreign investors.

## INTRODUCTION

One of the main roles of the Economic Research Institute for ASEAN and East Asia (ERIA) is to study three key subject areas for regional integration of East Asia. These are on deepening integration, narrowing gaps, and sustaining growth. The topic on narrowing gaps has focused on the development of Cambodia, Lao, Myanmar, and Vietnam.

While there are many large industrial agglomerations or clusters in East Asia, there are none in Cambodia, Lao, Myanmar, and Vietnam (except in Northern Vietnam). It may be difficult to narrow the gaps in East Asia without any industrial clusters in Cambodia, Lao, Myanmar, and Vietnam.

In his development theory, Nurkse (1953) explained that there exist vicious cycles of poverty in developing countries. Nelson (1956) also proved that there exists a

low-level equilibrium trap. Yokoyama (1997) derived the policy implications as follows: To get out of the trap and take off, developing countries must attain critical minimum effort via the big push concept. Rostow (1960), Rosenstein-Rodan (1943), and Leibenstein (1957) advanced these concepts of take-off, big push, critical minimum effort, respectively. Lewis (1954), Ranis and Fei (1961), Jorgenson (1967), and others discussed a dual economy that consists of traditional customary economy and modern market economy. A modern economy is needed to give employment opportunities to redundant labor in the traditional economy. Hirschman (1958) recommended fostering industries with high values of backward linkage effects at growing points or poles.

A closed economy, protectionism and centralization dominate the economies before the 1980s. However, the economic conditions saw a marked change after the 1980s. President Ronald Reagan introduced a new economic policy called Reaganomics, China adopted an Open-Door Policy, and the World Bank implemented its Structural Adjustment Policy. All these policies promoted the shift from the planned economy to the market economy. The principles of the open economy, free market, and decentralization started to dominate. Global trade and investment were liberalized.

Economies moved away from the import substitution policy, which dominated the era before the 1980s, and toward the export-led policy that the World Bank called the "export push strategy adopted in Asia." The most important change in the development strategy, however, was when Asian economies introduced the foreign direct investment (FDI) by liberalizing the inflow of foreign investment.

In sum, foreign investors in the modern economy were instrumental to the big push that paved the way for Asian countries to free themselves from their low-level equilibrium trap after the 1980s. That is, the idea of industrial clusters was tapped to make foreign investors agglomerate in industrial zones in the Asian economies.

The ERIA proposes practical policy measures for regional integration. Its Poverty Reduction Strategy Papers promotes and recognizes the participation of donor agencies and recipients. Section 2 of this study aims to apply the flowchart approach to the industrial cluster policy and recommends policy measures for Cambodia, Lao, Myanmar, and Vietnam based on the results of our questionnaire survey. Section 3 applies the flowchart approach to the feedback processes of Northern Vietnam and Guangzhou in China. Section 4 concludes the paper.

# 1. PATTERNS OF THE FLOWCHART APPROACH

This paper aims to propose a flowchart that shows sufficient conditions that can lead to the successful formation of an industrial cluster.

## 1.1 A general model of the flowchart approach: From the diamond model in the form of a plane to the flowchart model in the form of a line

Our flowchart approach is not an empty theory but a practical hypothesis applicable to the industrial cluster policy. We can form a cluster if we follow the following steps: Find ingredients or factors such as establishing industrial zones, build capacity, and invite an anchor firm. Figure 1.1 shows 'industrial zone', 'capacity building', and 'anchor firm',

(i) From the flowchart above, select the minimum number of ingredients. Figure 1.2 shows C, A and E.

(ii) Order the ingredients along a flowchart (Figure 1.3). The number of ways we prioritize them is a mathematical 'permutation' and 3! = 3*2*1. In general, $n! = n*(n-1)*(n-2)*\ldots*3*2*1$. We can, however, implement only one policy. Therefore, we must prioritize the policy measures.

**Figure 1.1**
**A Model of Flowchart Approach**

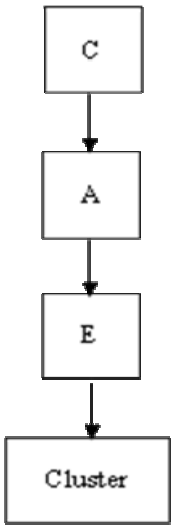



**Figure 1.2**
**An Example of Flowchart Approach**

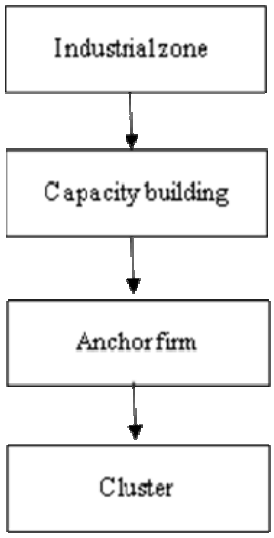
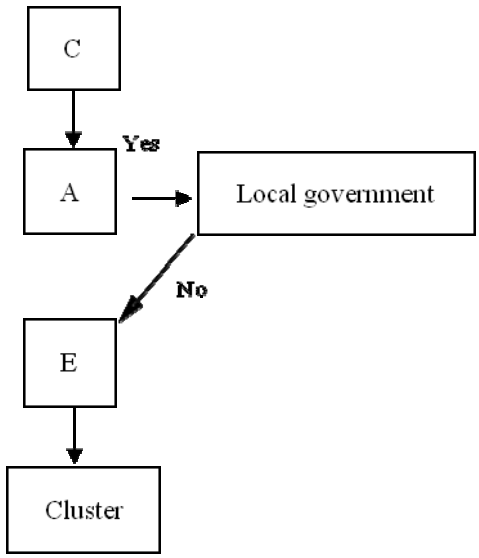


**Figure 1.3**
**Roles of Actors of Flowchart Approach**




(iii) Specify actors such as central government, local government, non-governmental organizations, or private firms and move forward one step in the flowchart if the answer is ”No”.

The flowchart approach has three functions: It prioritizes policy measures, specifies players and gives prescriptions regarding the industrial cluster policy.

### 1.2 A prototype flowchart model for the cluster policy

Our flowchart of the manufacturing industry cluster policy proceeds as follows: First, a local government establishes an industrial zone to attract foreign investors. Second, the government builds capacity for improving the business and living conditions of foreign investors. Elements of capacity building include: (i) constructing physical infrastructure: (ii) building institutions; (iii) developing human resources; and (iv) creating living conditions amenable to foreign investors. Physical infrastructure refers to roads, ports, communications, etc. Institutional building, which is also crucial in attracting foreign investors, includes streamlining investment procedures through one-stop services, deregulation, and introduction of preferential tax systems. Human resources, which are usually an initial condition for foreign investors, include unskilled labor, skilled labor, managers, researchers, and professionals. The living environment, on the other hand,

includes the provision of hospitals and international schools.

An anchor firm will be ready to invest after this capacity building has been carried out. The anchor firm is defined as one with a high value of the backward linkage in manufacturing. Along this line, the Rasmussen method is based on the column sums of the Leontief inverse to measure intersectoral linkages. The backward linkage based on the Leontief inverse matrix is defined as the column sums of the inverse matrix.

$BLRj = \Sigma^{n}_{i=1} l_{ij,}$

where $l_{ij}$ is the *ij'*th element of Leontief inverse matrix that is denoted by $L = (I - A)^{-1}$.

*BLRj* is backward linkage for sector *j* which reflects the effects of an increase in final demand. It represents the power of an industry to generate derived demand from other industries. Core competencies of a region should be established to attract the anchor firm.

### 1.3 Step I. Agglomeration

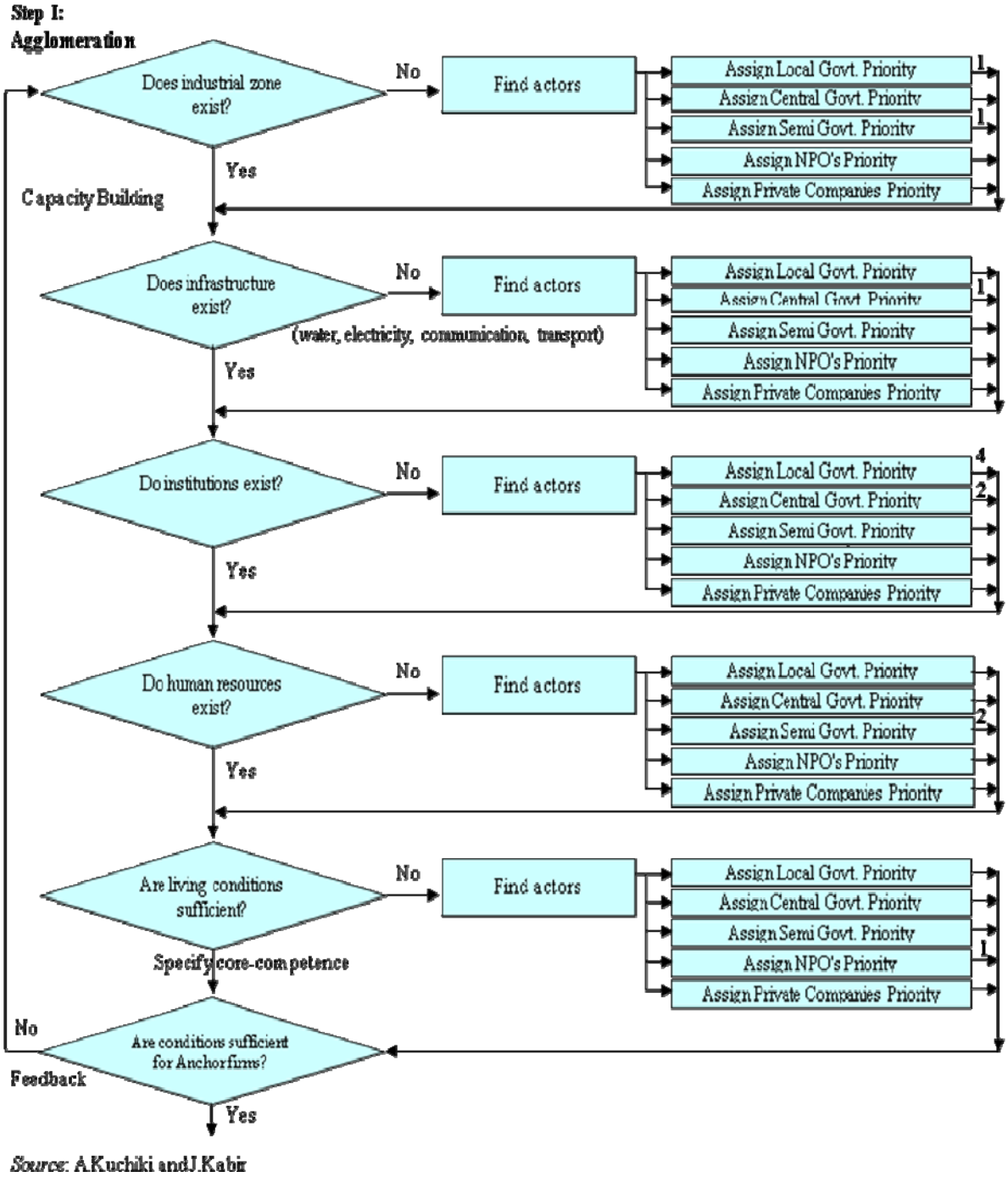
Our flowchart approach is illustrated in Figure 2. First, we ask whether industrial zones have been established. If they have not, we must decide which actors should establish such zones. Once these actors are identified, we return to the main stream of the flowchart.

Next, we look at the second step, capacity building, which takes place after the establishment of industrial zones. We examine whether there is adequate water supply for the industrial zones (Figure 3). We then proceed along the flowchart to examine power supply, communication, and transportation.

After looking at the physical infrastructure, we examine whether institutions are in place. The central government must institutionalize national tax systems and the local government must institutionalize local tax systems. One-stop investment procedures are crucial for successfully attracting foreign investors.

In the area of human resource development, an abundance of unskilled labor with a high literacy rate is a necessary condition for luring foreign investors whose purpose is to employ cheap labor. On the other hand, an industrial cluster sometimes faces a shortage of skilled labor after industrialization has progressed. Universities and on-the-job training centers for innovation are then needed for further development.

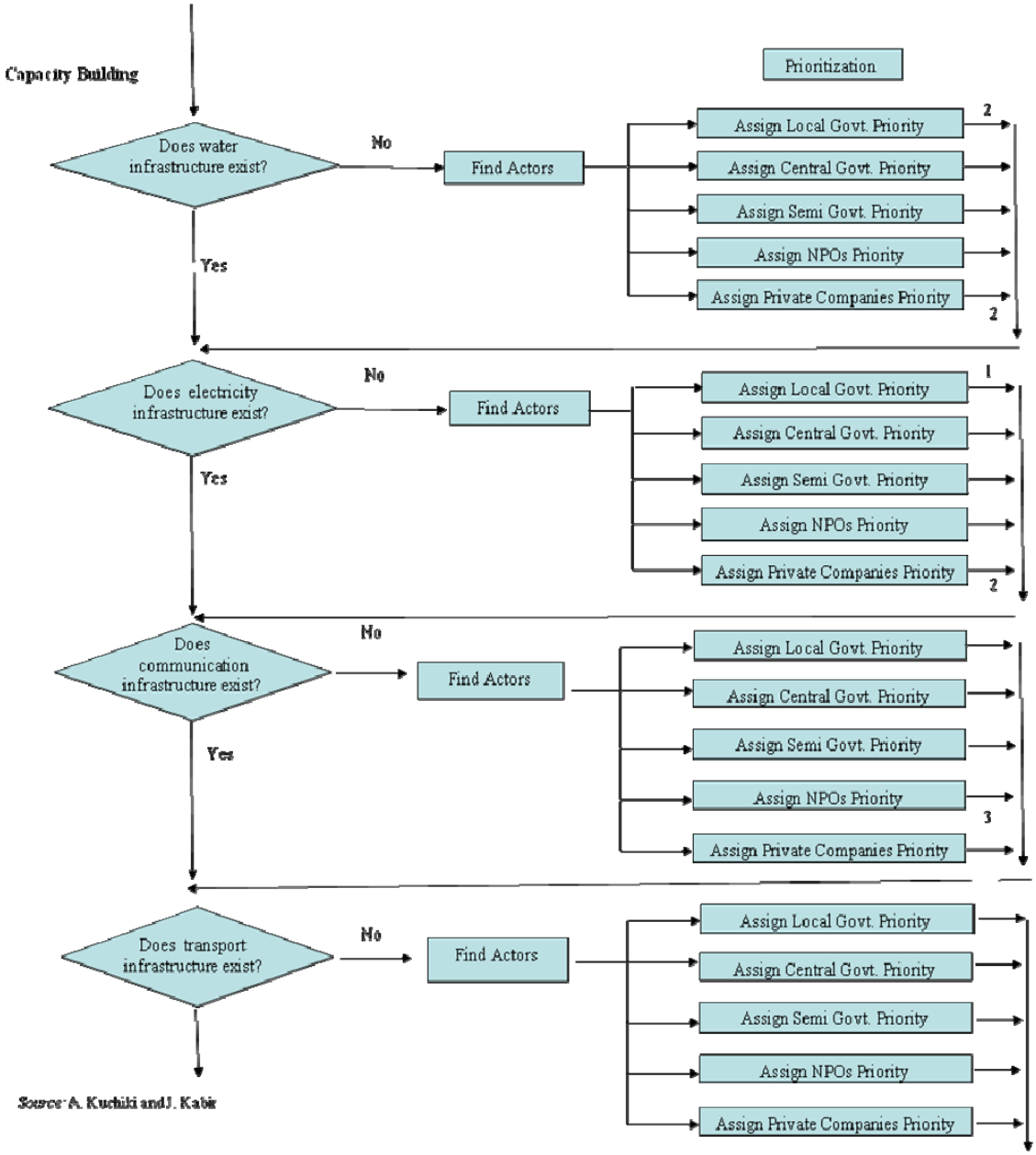
**Figure 2: Flowchart Approach: Step I. Agglomeration**




*Source*: A.Kuchiki and J.Kabir

Living conditions are equally crucial in the equation. Researchers from investor companies have incentives for work hard if they can enjoy their lives; it is important to create satisfactory conditions in areas such as housing, schools, hospitals, etc. These are the final conditions that must be satisfied to bring in anchor firms.

**Figure 3. Flowchart Approach: Step Ⅰ. Infrastructure (Capacity Building)**



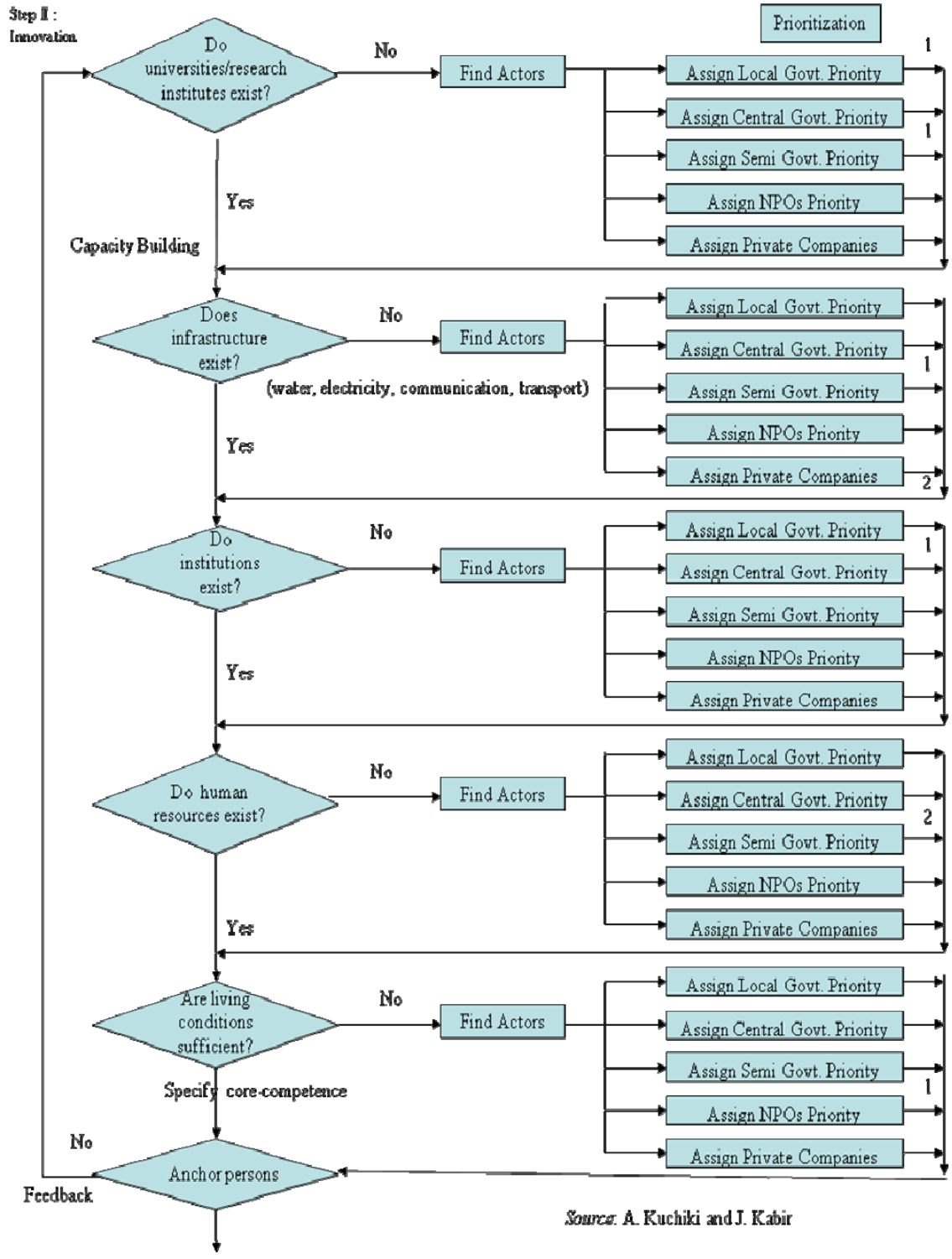

Here, the anchor firm is defined as one belonging to the manufacturing industry and having a high value of backward linkage effect in its input-output relationship

### 1.4 Step II. Innovation

Intellectual property rights should be enforced in Step II (innovation), as shown in Figure 4. Preconditions for Step II are: (i) Related services: finance and insurance, logistics,

marketing companies, repair shops, and used car shops; and (ii) Professional and other services: lawyers, restaurants, retail shops, and tourism.

**Figure 4. Flowchart Approach: Step Ⅱ. Innovation**



As shown in Figure 1, the factors that lead to innovation are: (i) universities and research institutes; (ii) capacity building of infrastructure, institutional reforms, human resources, and living conditions: and (iii) anchor persons.

Meanwhile, joint actions or activities that support innovation are: (i) facilitating cluster skill centers; (ii) establishing collective projects; (iii) creating business associations; and (iv) implementing a branding strategy.

The linear instruments and interactive approach of policy instruments for innovation may be as follows:

*Linear instruments*: (i) direct R&D aids; (ii) transfer of research-based knowledge to firms; and (iii) financial support:

*Interactive approach*: (i) improvement of institutions and programs that provide technology transfer services; and (ii) policy to stimulate networking and business clusters.

We earlier identified the minimum prerequisites, ie., universities and research institutes, capacity building and anchor persons, to simplify the flowchart of Step II and prioritize policy measures. Most Asian countries are still at the door of innovation, and we cannot find a huge number of the experiences on innovation in Asia. Step II is still a hypothesis to be further examined.

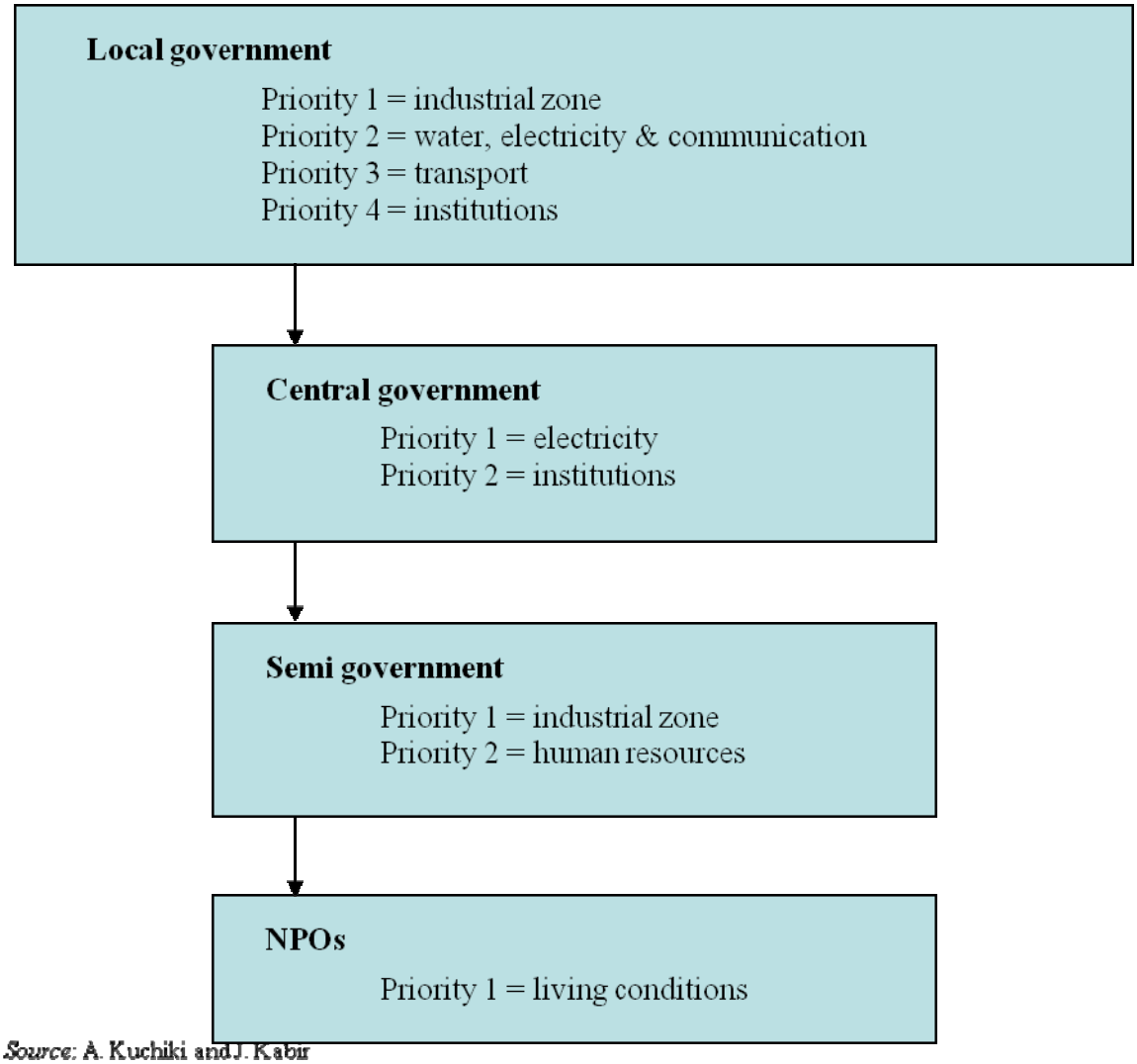
Figure 5 shows the priorities of each actor or player. Local governments play a crucial role in establishing industrial zones, supplying electricity, facilitating transport, and forming institutions. The first priority of local government in Figure 5 is to construct industrial zones for foreign investors. The second priority during that stage is to supply electricity, facilitate transportation, and form institutions. The central government's main priorities are to supply electricity and build institutions.

The flowchart approach to industrial cluster policy can be applied to other regions in the following cases:

(i) Where there are newly-formed industrial clusters (ex-ante application): Examine whether each step of the flowchart is a "Yes" or "No" and find players if the answer is "No".

(ii) To evaluate the failed cases of industrial cluster policies (ex-post evaluation): Examine whether each step of the flowchart is a "Yes" or "No", find reasons why it failed if the answer is "No", and proceed to the next step.

**Figure 5. Priorities of actors**



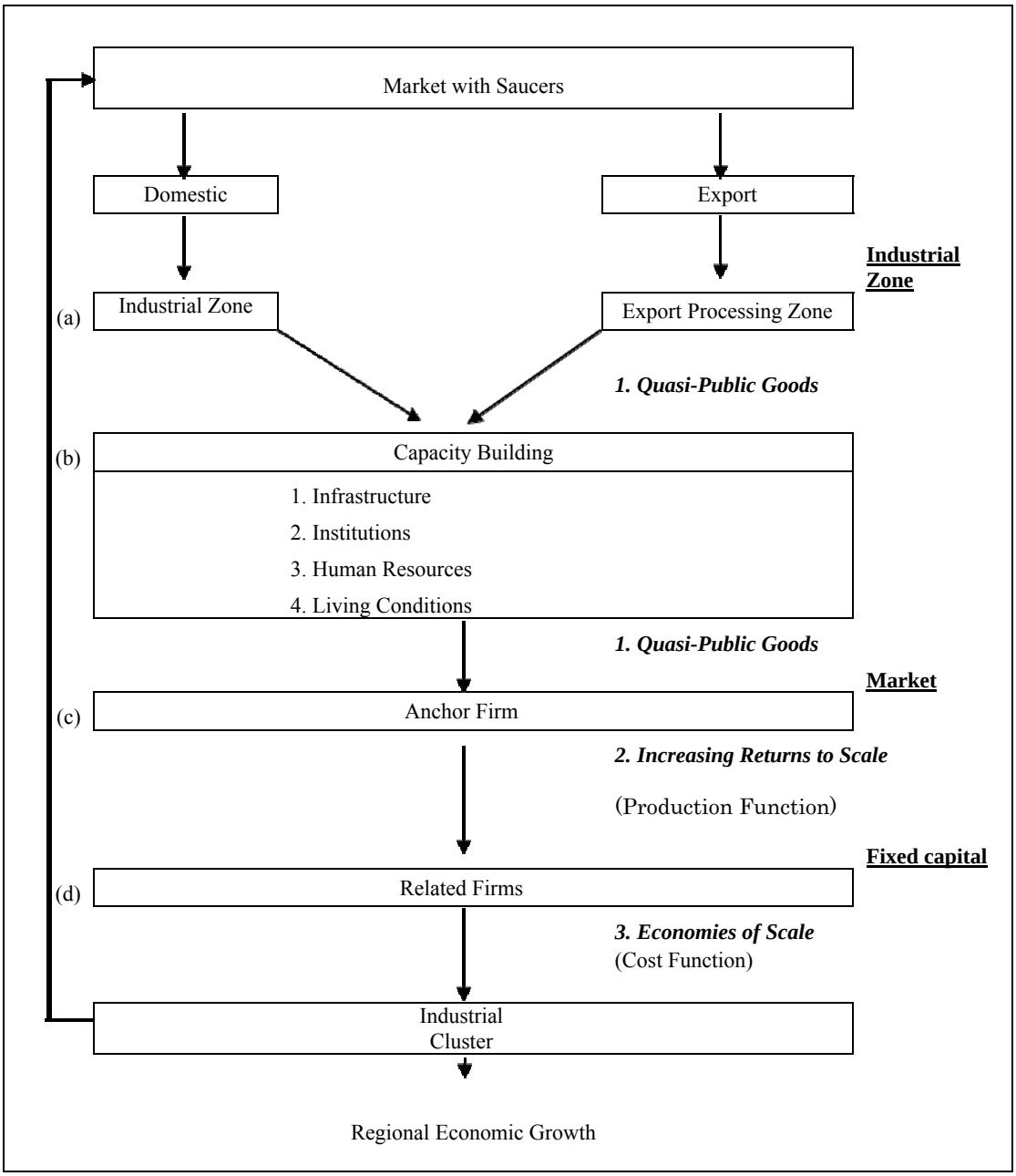

*Source*: A. Kuchiki and J. Kabir

(iii) Where industrial cluster policies have been successful, so as to prescribe such for their next upgrading (ex-post prescription): Examine whether each step of the flowchart is a ”Yes” or ” No”. Find players if the answer is ”No”, and prescribe the region for its industrial cluster policy.

This section further recommends that for the “flowchart approach to an industrial cluster policy” to help form industrial clusters in the manufacturing industry in Asia, certain conditions would first have to be met. The formation of industrial clusters in

East Asia was typically theorized by defining the role of "quasi-public goods". Also, the industrial cluster policy was proven to enhance economic growth under a production function of "increasing returns to scale". Another factor was the critical amount of production under "scale economies", which firms used as basis for deciding whether or not to invest in clusters.

**Figure 6. An Industrial Cluster Formed by an Anchor Firm**




*Source*: Kuchiki (2008)

The importance of the concepts of quasi-public goods, increasing returns to scale, and economies of scale in development is shown in Figure 6. Once more, it is reiterated here that sufficient conditions for development are to establish industrial zones, to build capacity, and to invite anchor firms and their related firms.

First, note that industrial zones, capacity building in physical infrastructure, institutions, and human resources as quasi-public goods are provided by both organizations in the quasi-public sector and firms in the private sector. Second, the ability of an industrial cluster policy to provide industrial zones and capacity as quasi-public goods can enhance regional economic growth in cases where an anchor firm operates under increasing returns to scale. For instance, markets for sales in China are at an early stage of development and large enough for anchor companies to attain increasing returns to scale. Third, the minimum optimal size of car production economies of scale depends on the size of fixed capital of anchor companies' related firms.

The flowchart approach to an industrial cluster policy further emphasizes the importance of ordering and timing of policy measures. The flow of policy implementation is as thus: to establish an industrial zone, to invite an anchor company, and to encourage its related companies to invest in the industrial zone. Then, the recipient country's government reduces its role in order to promote competition. It transfers greater authority to local governments and makes more use of the quasi-public sector (i.e., public corporations and state enterprises). As a result, the quasi-public sector is likely to supply quasi-public goods. The improvement and expansion of networks in Asia by both multinational corporations and the quasi-public sector are thus prerequisites to the upgrade of Asia's industrial structures. Leadership, too, is crucial to the success of an industrial cluster policy.

## 2. PRESCRIPTIONS FOR THE INDUSTRIAL CLUSTER POLICY OF HANOI AND GUANGZHOU

We propose that, upon considering the current status of Northern Vietnam, an industrial policy can take one of the following three options. First, the flowchart goes to Step II: Innovation. Second, the flowchart feeds back to the capacity building stage. Third, the local related firms venture into partnerships with foreign firms.

### 2.1 Hanoi

At this point, let us examine the second option and raise the following 12 questions:

1. Do industrial zones exist sufficiently?

In terms of capacity building: 2. Is the transport infrastructure sufficient?

3. Does the electricity infrastructure exist?
4. Does the communication infrastructure exist?
5. Does the port infrastructure exist?
6. Do institutions exist?

On human resource:

7. Does unskilled labor exist?
8. Is skilled labor sufficient?

On living conditions:

9. Are there sufficient hospitals?
10. Are there sufficient schools?
11. Are there sufficient entertainment venues?
12. Are there incidences of theft in the area?

We carried out a survey on the industrial cluster policy of Northern Vietnam to determine whether we can solve its problems using our flowchart approach. We interviewed 10 professionals. The 10 respondents included six staff of companies in Hanoi, three staff of Japanese semi-government organizations in Hanoi, and one Japanese professor studying the Vietnamese economy. The six results are summarized in Table 1.

**Table 1. Questionnaires on industrial cluster policy: Hanoi**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Results | Problems |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Do industrial zones exist sufficiently? | O | O | O | O | O | O | O | O | O | O | 10 | |
| **Capacity building: Physical infrastructure** | | | | | | | | | | | | |
| 2. Does transport infrastructure exist sufficiently? | X | X | X | X | X | X | X | X | X | X | 0 | X |
| 3. Does electricity infrastructure exist sufficiently? | X | X | X | X | X | X | X | O | O | O | 3 | X |
| 4. Does communication infrastructure exist sufficiently? | O | O | O | O | O | O | O | X | O | X | 8 | |
| 5. Does port infrastructure exist sufficiently? | X | X | O | O | X | X | X | X | X | X | 2 | X |
| 6. Do institutions exist sufficiently? | X | X | X | X | X | X | X | X | X | X | 0 | X |
| **Human resources** | | | | | | | | | | | | |
| 7. Does unskilled labor exist sufficiently? | X | X | X | X | X | X | X | X | X | X | 0 | X |
| 8. Does skilled labor exist sufficiently? | X | X | O | O | O | O | O | O | O | O | 8 | |
| **Living conditions** | | | | | | | | | | | | |
| 9. Do hospitals exist sufficiently? | O | O | X | X | O | O | X | O | O | X | 6 | |
| 10. Do schools exist sufficiently? | O | O | O | O | O | O | O | O | O | O | 10 | |
| 11. Do entertainments exist sufficiently? | O | O | X | X | X | X | X | O | O | O | 5 | X |
| 12. Do thefts happen? | X | X | X | X | X | O | O | O | O | O | 5 | X |

*Source*: A. Kuchiki and T. Gokan (interviews in Hanoi on Aug. 28-30, 2008)

On the issue of industrial zones, no respondent answered "Yes." Our survey confirmed that roads, electricity and ports are insufficient in their support of industrial clusters. Specifically, on the question surrounding highway roads meant for automobiles, all 10 respondents answered "No." Such refers in particular to the roads in these areas: (i) Hanoi – Haiphong; (ii) Hanoi – southern China; and (iii) Hanoi – Noibai Airport. Seven out of 10 gave a "No" reply regarding the sufficiency of the electricity supply. Three who belonged to firms located in Thanglong Industrial Park, answered "No". They had no problem regarding electricity supply since their companies were given priority for such.

In terms of communication, two of the 10 respondents answered "No". That is, the connectivity of the email system in Vietnam sometimes encountered issues.

On the issue of ports, eight respondents answered "No". The other two also answered "No" but were unaware of problems at the ports since they often availed of the services of logistics companies in the delivery of their materials and products, and therefore did not directly use ports. In sum, these mean that all respondents highlighted

the problem with the ports. Haiphong Port in Northern Vietnam is a river port and has a shallow depth of 5-7 meters. Cailan Port is located in Halong Bay and an alternative to Haiphong Port. However, one of the concerns here is that the development of Cailan Port would harm Halong Bay, which is a world heritage. Therefore, it has become necessary to expand the facility of Haiphong Port. Currently, cargoes at the port are loaded into a small ship, sent to the Hong Kong Port, and loaded into a large ship again.

Meanwhile, when it comes to institutions, all respondents answered "No" as well. Of all the 12 questions, this is where the problem was found to be most serious. In particular, it is in customs clearance where there are four grave issues. First, every document passing through customs clearance need to be translated into the Vietnamese language. Second, every document should be original. Third, companies should put their stamps on their documents. Fourth, every document needs the signatures of companies. In short, having these original documents pass on from one place to another in Northern Vietnam for the required stamps and signatures carry with them certain costs.

Transporting cargos from Hanoi to the border of southern China also faces three problems. First, working hours at the customs clearance office at the border is short. Operating hours at the Vietnam-China border of 8:00am. to 5:00pm differs from the usual working hours of 9:00am to 4:00pm. Also, because the time difference between Vietnam and China is one hour, actual operation hours at the border total six hours only. Thus, trucks would be required to spend one night at the border whenever they fail to reach the border during the given operating hours. Each night spent presents a cost.

Second, costs add up whenever container cargos have to be trans-shipped (That is, whenever cargos are unloaded from one truck in Hanoi and loaded to another truck at the Chinese border). Other problems related to transshipment of container cargos include theft, damage to goods, and the usual delay. Given that a truck consists of its cab and container parts, transportation costs could be reduced if the container part would be allowed to pass beyond the Vietnam and China border.

Third, the road situation is in a sorry state. First, there is a lot of fatal traffic accidents on the Vietnamese highways since these are not exclusive to automobiles only. That is, bicycles and motorcycles are allowed on the highways. Also, the speed of trucks on the Vietnamese highways is slower compared with those in Thailand and Lao due to the former's road conditions. For instance, according to one respondent at the Thanglong

Industrial Park, the speed in Vietnam is 30 kph while that in Thailand is 50 kph.

Meanwhile, implementing rules at the customs clearance office in Vietnam are not transparent. Rules allegedly change so often and implemented in a discretionary manner.

All 10 respondents also gave a "No" reply to the question on unskilled labor, partly because illegal strikes occurred in many firms in 2008. Firms have been obliged to establish labor unions starting 2008. Also, the power to designate the labor union president has been transferred from the company boards to the labor unions themselves starting 2009. It is therefore understandable why corporate boards now feel uneasy regarding the future of labor unions.

The unskilled labor market in Hanoi has contracted. For example, when firm A began hiring in 2007 and 2008, the number of its applicants at the Thanglong Industrial Park dropped to 170 in 2008 from 700 in 2007. In the past, this firm employed its workers around the Hanoi area but was increasingly forced to consider those from the mountainous areas far from Hanoi. Later, the firm had to construct an apartment for the workers to live in. The share of workers from Hanoi dropped from 70 percent to 30 percent. Meanwhile, the share of workers from the mountain areas rose to 10 percent by 2008.

On the other hand, two of the 10 respondents answered "No" on the issue of skilled labor. Like in most Asian countries, the phenomenon called job hopping is common. One respondent pointed out that it is difficult to find Vietnamese applicants who can speak Japanese, and that Japanese firms should employ Vietnamese who can speak English instead. There is also a shortage of Vietnamese who can speak the Chinese and Korean languages.

On the issue of living conditions, most respondents answered "Yes", although four replied "No" on the question specific to hospitals. Respondents usually opt to go to hospitals in Bangkok or Singapore for serious illnesses rather than to a Hanoi-based one. In addition, a few firms periodically bring in food from Japan as a precaution against bird influenza in Vietnam.

On the question on entertainment, some respondents answered "No". They could not enjoy Saturdays and Sundays due to the shortage of entertainment facilities such as shopping centers and movies.

Five respondents pointed out that theft of raw materials such as copper coils happens since some workers have not yet imbibed the values these companies espouse. It takes time before workers begin to change their values.

In sum, the issues critical to the improvement of Vietnam's investment environment in 2008 are those on highways, electricity, ports, customs clearance, and unskilled labor.

### 2.2 Guangzhou

Guangzhou's industrial policy may take one of three options. First, the flowchart proceeds to Step II: Innovation. Second, the flowchart feeds back to the capacity building phase. Third, local related firms venture into partnerships with foreign firms. This section examines the second option and poses the same 11 questions used for the Hanoi study.

A survey of the industrial cluster policy of Guangzhou was carried out to determine whether we can solve its problems using the flowchart approach. We interviewed 10 professionals via a questionnaire survey, and came up with the six results summarized in Table 2. The 10 respondents included six staff of companies in

**Table 2. Questionnaires on industrial cluster policy: Guangzhou**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Results | Problems |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Do industrial zones exist sufficiently? | O | X | O | X | X | X | X | O | X | X | 3 | X |
| **Capacity building:** | | | | | | | | | | | | |
| 2. Does transport infrastructure exist sufficiently? | O | O | O | O | O | O | O | O | O | O | 10 | |
| 3. Does electricity infrastructure exist sufficiently? | X | X | O | X | X | X | X | X | X | O | 2 | X |
| 4. Does communication infrastructure exist sufficiently? | O | O | O | O | O | O | O | O | O | O | 10 | |
| 5. Do institutions exist sufficiently? | X | X | X | X | X | X | X | X | X | X | 0 | X |
| **Human resources** | | | | | | | | | | | | |
| 6. Unskilled labor | O | O | O | X | X | X | X | O | X | X | 4 | X |
| 7. Skilled labor | X | O | O | O | O | O | O | O | O | X | 8 | |
| **Living conditions** | | | | | | | | | | | | |
| 8. Do hospitals exist sufficiently? | O | O | X | X | O | O | X | O | O | X | 6 | X |
| 9. Do schools exist sufficiently? | O | O | O | O | O | O | O | O | O | O | 10 | |
| 10. Do entertainments exist sufficiently? | O | O | O | O | O | O | O | O | O | O | 10 | |

*Source*: A. Kuchiki and T. Gokan (interviews in Guangzhou on Aug. 24-27, 2008.)

Guangzhou, two staff of Japanese semi-government organizations in Guangzhou, and one Japanese professor and one researcher studying the Vietnamese economy.

The investment environment issues of the Guangzhou Authority are land, electricity, and institutions. Below are the details on the result of our questionnaire survey (Chapter ).

On the issue on land, eight of 10 respondents answered ‘”No”. That is, there is currently a shortage of land in Guangzhou. The Guangzhou municipality has changed its policy from attracting labor-intensive industries to attracting high value-added industries without the environmental issues. It is difficult for firms that do not meet the requirements of the policy to be approved by the government. One of the respondents who applied to set up business in the site told us that it was highly improbable for his firm to be approved. There is shortage of land in Guangzhou even if there is still some available at Zhongshan, Foshan or Shunde.

The Dalian municipality experienced the same situation around 2000 and introduced a policy to shift labor-intensive industries from Dalian to the inland areas. In fact, Guangzhou’s current situation is the same as Dalian’s at that time.

Meanwhile, as far as electricity goes, nine out of 10 respondents answered ”No”. Two of the 10 sampled answered ”Yes” since their firms are located in the district where the Guangzhou municipality has prioritized the supply of electricity. The survey also showed that there were no problems with other infrastructure such as roads, communication, and ports.

When it comes to customs clearance, tax systems, and foreign currency transactions, all respondents answered ”No”. The Guangzhou municipality has its own two institutions on customs clearance. One is called the *Rairyokako,* whose parts and components are exempted from import tariffs when their products are exported. . Another, called *Tensho*, has parts and components exempted from the value-added tax when their final products are exported, even if the parts and components are purchased not from foreign countries but from firms in Guangdong Province. The local government temporarily sets the reduction rate at 7 percent for import tariffs and 15 percent for the value added tax. The total maximum rate is 22 percent. The increase in minimum wages in Guangzhou is from 10 percent to 14 percent. The wage rate hike is 10 percent per year, but becomes 30 percent in three years, and is more than 22 percent when the reduction

rate is the maximum due to the Rairyoukako and Tensho. One of the respondents pointed out that labor-intensive industries such as the textile and the shoe industries will find it difficult to stay in Guangzhou. In addition, the Tensho reduction rate applied to 1,000 kinds of commodities is 10 percent. The firms in Guangzhou are forced to move to places where wages are lower than those of Guangzhou in three years or earlier.

Regarding foreign currency transactions, one of the 10 respondents pointed out how long a time it takes for approvals on foreign currency transactions to be completed and sent to his firm in China for the import of parts and components. As to unskilled labor, six respondents answered ”No” since the increase in minimum wage rates is high in recent years. One of the respondents who stayed in both China and Malaysia pointed out that the wage, including welfare costs, of unskilled labor in Guangzhou is around 20,000 thousand yen while that in Malaysia is 15,000 yen. It is partly because China’s welfare costs are higher than that of other Asian countries. Guangzhou is getting more uncompetitive in the wages of unskilled labor than Malaysia does.

Many economists have debated on whether China has passed its turning point. Such turning point is explained as follows: The supply of labor can be unlimited at the minimum subsistence-level wage before the turning point. Then, there will come a time after such turning point when residual labor is absorbed and wages become higher than the minimum subsistence level.

We can attest that the Guangzhou Authority has passed the turning point. It will be difficult for labor-intensive industries to hold its office in Guangzhou. The labor-intensive industries have no other choices but to change into high value-added industries or shift to areas where wages are low. Possible ones may be Nangning or Beihai in Gungxi Zhuangzu Zizhiqu, or Human Province. Northern Vietnam may be another alternative.

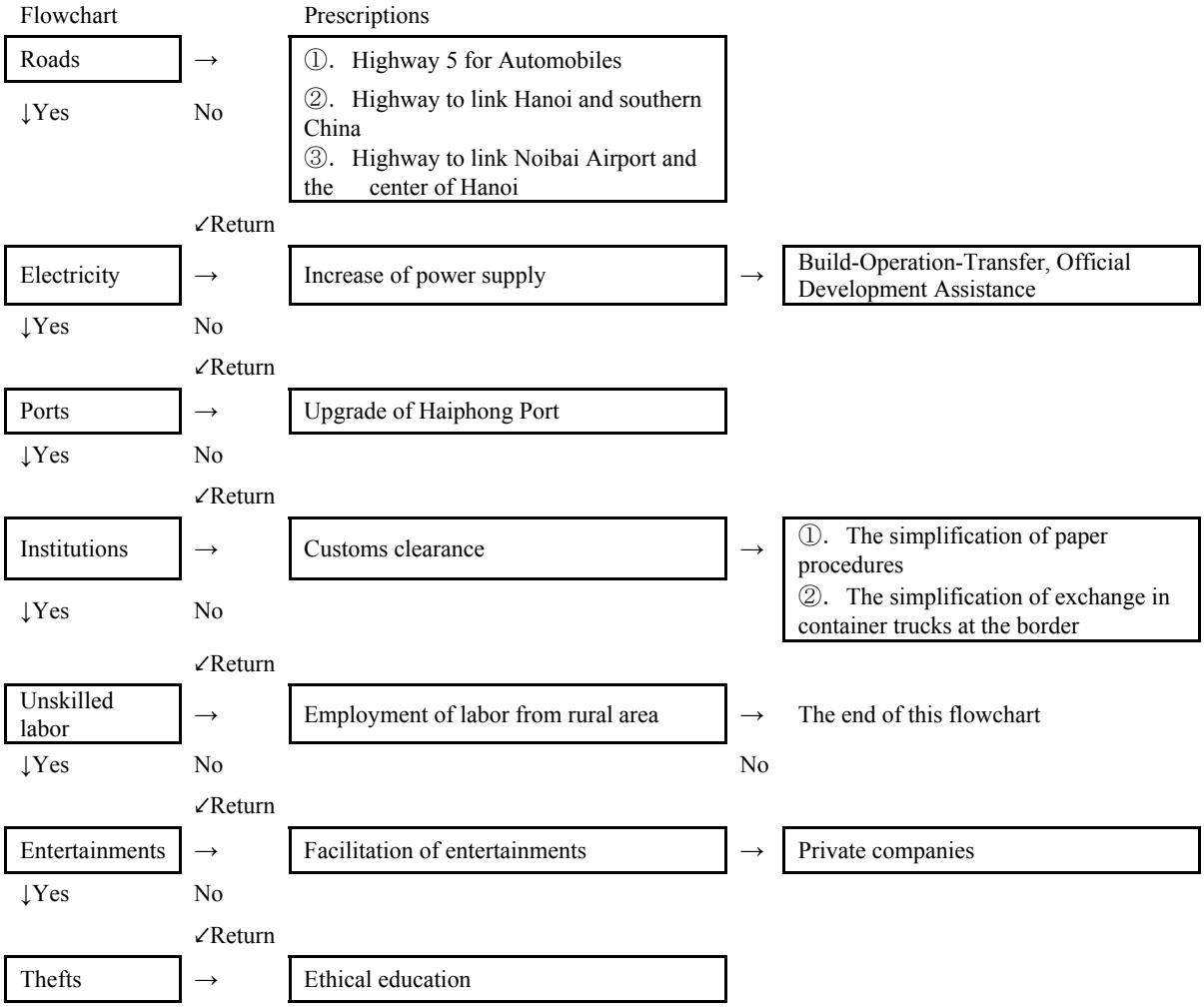
On the other hand, there is a shortage in electricity in China, including Guangzhou. Nine of the 10 respondents answered ”No”. One of the ten answered ”Yes” only because the Guangzhou Authority prioritizes his firm in the supply of electricity.

Finally, living conditions were found to have few problems only since they have been improved in recent years. Only four respondents answered ”No” regarding hospitals. This concern found here is common in other Asian countries. Patients needing critical help would have to fly to Hong Kong or Japan.

### 2.3 Recommendations on the industrial cluster policy of Northern Vietnam

Recommendations regarding the industrial cluster policy in Northern Vietnam are shown in Figure 7. Northern Vietnam needs the infrastructure that will facilitate its next-stage growth since it has reached around $900 per capita income in 2008. First, the new route 5 highway specific to cars between Hanoi and Haiphong is needed. Second, there is also a need for a highway between Hanoi and Southern China. Such should be of the same level as China's three-lane highway each way. Third, a highway between Noibai Airport and the center of Hanoi is needed. Vietnam would benefit from a highway that links Noibai Airport to Hoalac Hitech Park, and Hoalac Hitech Park and the center of Hanoi. The three lanes-per way highways will contribute to economic growth and reduce the number of traffic accidents.

**Figure 7. Nortern Vietnam's Flowchart**




*Source*: Author.

Meanwhile, there would be electricity supply issues in Hanoi even if Northern Vietnam imports electricity from China. Such industry needs to be developed by the private sector through a build-operate-transfer scheme or official development assistance.

Cairan Port should be expanded and Haiphong Port should be further improved. Customs clearance procedures should be more transparent and simplified. For example, the format of customs clearance should be straightforward by omitting signatures and stamps. Transshipment rules should be amended. Rules should allow containers to travel from points of origin to destination instead of having to unload contents at borders and transfer these into another truck.

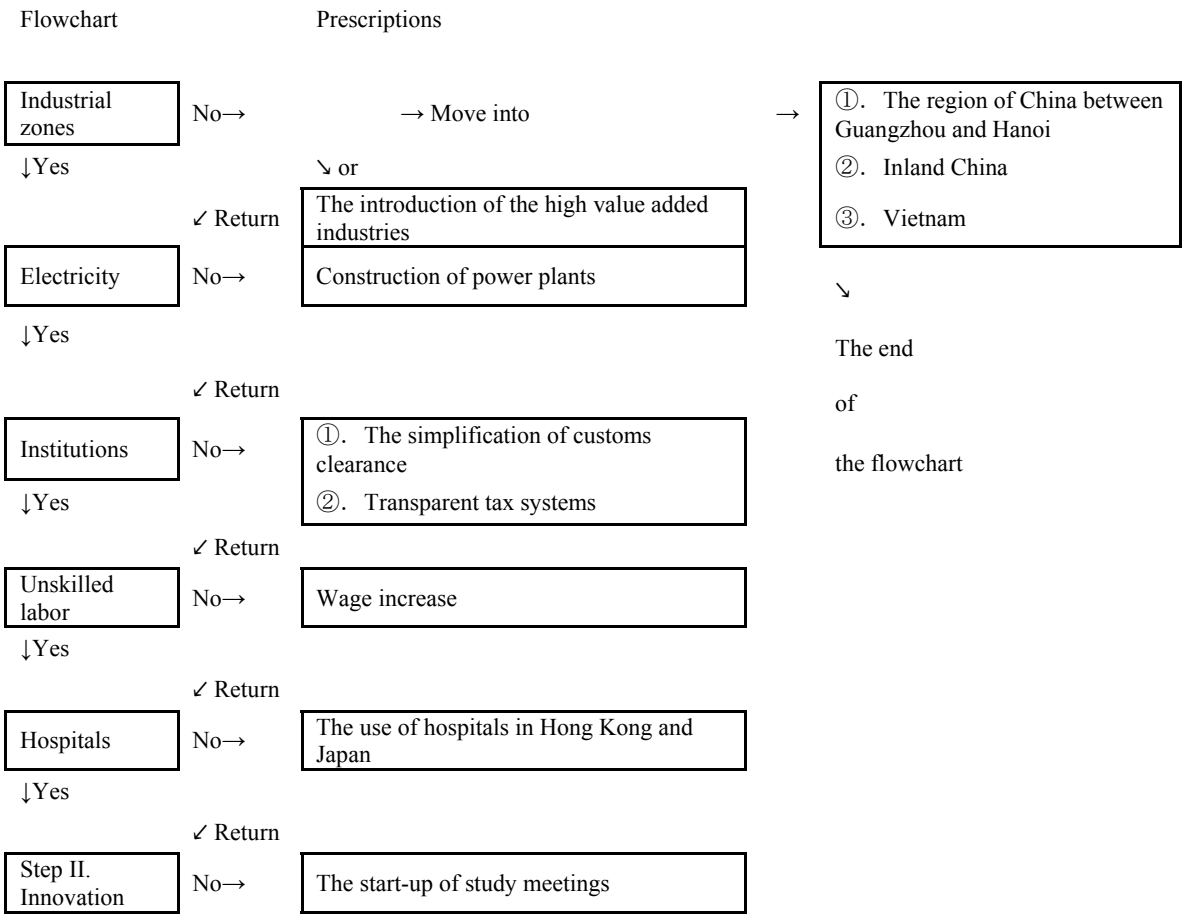
Unskilled labor should be sourced from all over the country, including local villages. Thus, apartments for the unskilled labor have to be constructed. Their employment will help reduce the income gap of residents living between Hanoi and mountain areas. Meanwhile, the problem of theft takes time to eradicate as this requires educating people on moral ethics.

Guangzhou is losing its competitiveness in the labor-intensive industries and has been moving toward the innovative process stage of Step II in our flowchart approach. On the other hand, the per-capita income in Northern Vietnam has reached almost $1000 and is therefore moving toward its turning point; therefore, it should be preparing by upgrading its infrastructure such as loads, ports, and electricity. Hanoi and Guangzhou benefit each other by constructing a highway between Hanoi and Youyi Xian in Southern China and simplifying customs clearance procedures. The reduction of a tariff rate from China to Vietnam will be effective in linking the two cities since the tariff rate is 5 percent higher than that from Vietnam to China.

### 2.4 Recommendations on Guangzhou's industrial cluster policy based on the flowchart approach .

Recommendations for Guangzhou are in Figure 8. Due to the shortage of land, firms will be forced to relocate to areas where there are lower wages or change their products into those in the high value-added industries.

**Figure 8. Guangzhou's Flowchart**




*Source*: Author.

The options on how to increase Guangzhou's electricity supply are limited. The alternatives are atomic power, heating power, and water power. As far as institutions are concerned, it is the customs clearance procedures that should be worked on. Firms too are forced to deal with higher wages for unskilled labor since they would need to abide by the country's minimum wage requirement. Meanwhile, patients with serious conditions have to seek medical care in Hong Kong or Japan.

Guangzhou should proceed to the innovative process stage of the flowchart approach. For that purpose, the formal exploratory meetings and research activities among firms in Guangzhou will activate innovation. Informal activities are at present already done.

## 3. ERIA QUESTIONAIRE SURVEY

The ERIA Questionnaire Survey and the Flowchart Approach Survey complement each other in their aim to recommend improvements in the industrial cluster policy within the region. The Flowchart Approach Survey outlines questions on the industrial cluster policy and the ERIA Questionnaire Survey details questions on the Flowchart Approach. Questions in Table in Chapter 5 are related to industrial zones of the flowchart approach, and institutions, physical infrastructure, human resource development, capacity building. The ERIA Questionnaire Survey helps identify projects under the official development assistance program.

## CONCLUSIONS

We established and applied our questionnaire method on the flowchart approach regarding the industrial cluster policy in Northern Vietnam. The prescription for Northern Vietnam is to construct highways for automobiles, increase electricity supply, build more capacity for ports, and enhance institutional workflow such as import procedures. We should pay attention not only to Vietnam itself but also to the regional integration of Asia when considering the industrial cluster policy. Kuchiki (2008a) called the region around China, ASEAN and India as the Asian Triangle of Growth.. The industrial cluster policy of Vietnam should be planned by considering this triangle. In particular, roads and ports should be linked to the regional integration of Asia.

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