

Cluster Policy in regional development of Japan

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Abstract. The article explores the main aspects of Cluster Policy in Japan. During a long period of time Japan has a great experience of realization the cluster policy in regional development. This country has unique experience in this sphere: technology parks, 'incubators', industrial parks, science parks and others. In modern stage of development Japanese government realizes a number of new Business Startup Support Programs for supporting innovation sectors in regions. This article also highlights the components of the government budget appropriation for Science & Technology under the several Science and Technology Basic Plans.

[Vorobeva N.A. **Cluster Policy in regional development of Japan.** *Life Sci J* 2014;11(12s):206-212] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 40

Keywords: regional policy, cluster policy, clusters, globalization, innovation policy, support of innovation, technology park, industrial park, science park, "Incubator", new technology-based firms (NTBFs), Science and Technology Basic Plan, Venture Support Programs, Subsidy Programs

Introduction

In today's global economy in the context of globalization the importance has a cluster approach in the framework of regional development policy and the connecting notion of clusters - of relationships firms and organizations in the region. In highly developed countries the cluster policy is the main factor to improve national and regional competitiveness for more than several years of government policy.

Cluster policy as a tool for development in regions has a number of advantages. First one is the universality of the cluster approach. Cluster policy can be constructed in regions on the basis of any comparative advantage, such as manufacturing, transportation and logistics, tourism, trade, innovation, education, construction, etc..

Secondly, the cluster policy is integrative. This comprehensive solution in the framework of the cluster approach the objectives of regional strategy aimed at improving the competitiveness of the regional economy, industrial policy, aimed at creating a competitive industrial complex in the region of transition to innovative development model, development of small and medium-sized businesses in collaboration with big business, improve the educational level of regions, regional infrastructure development.

Japan is a good example of how the deficit of natural resources may lead to a competitive advantage, it is obvious that the deficit has forced the country to develop and create innovative models, and energy-saving technologies. This country has a long experience of development the cluster policy, which includes some specific elements of combination the

government support of innovation process and private companies' investments.

Nowadays, in Japan it became a shift from technopolis's era to a new cluster projects (industrial parks, New Technology-Based Firms (NTBFs) and others). A lot of researchers identified the leading role of the government in modern planning of innovation process in regions of Japan. It also fixed in the New Economic Growth Strategy of Japan.

The main part

We began our analyses of cluster policy in Japan with identification of some theoretical aspects of its infrastructure.

The objects of innovation infrastructure are technology parks, special economic zones, new technology-based firms (NTBFs), 'Incubators', clusters and others.

The most widespread object of innovation infrastructure is 'Incubator'. Large-scale program for establishing incubators in developed countries was started in the middle XX, in developing countries - in the 1980-1990s.

By definition of European Business Innovation Centre Network, a business incubator is a specialized tool in the politics of regional economic development and regeneration by providing interdisciplinary professional support for small and medium innovative businesses in the international context [1].

The principal difference of incubator from other large objects of innovation infrastructure is that an incubator's aim is a support of small companies with high potential of growth which is at the beginning stage of its operation.

Incubators have increasing operation risk, it means that only one of ten innovative projects is successful, but on the other hand, it is impossible to identify in advance the success of the project, because it is determined only during the incubation process [2].

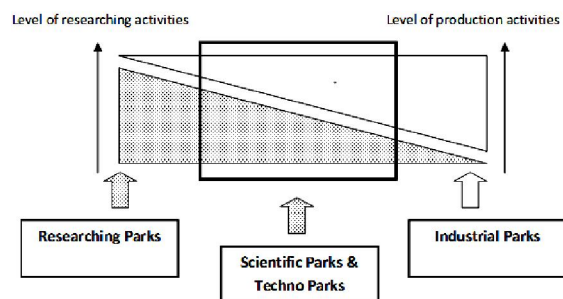
One of the largest objects to support the innovation process is *Technology Park*, which is being considered as the most effective integration form of education, science and industry. In addition to the term "technology park", we can often find the concept of "science park", "research park", "industrial park". Originally, these objects of innovation infrastructure had its own specificity, but during the time a border between all these concepts was erased.

Centers of technology transfer and business incubators are often being a part of the industrial park because, as experts say, for been profitable, it should have the expanded technology park around it.

First science parks appeared in the USA and Europe in the 1960s, in Asia - in 1970s. According to research in the world today, there are about 1.5 thousand of science parks [3]. Nowadays, it became more common tendency for spreading the science parks in Europe (in the UK there are more than 100) and in Asia (Japan, Korea, Taiwan, Singapore).

Many researchers consider that on the basis of industrial parks the process of cluster policy appeared. For example, in China in recent years it is implemented the major projects of developing the industrial parks of cluster type.

The various types of parks, depending on the research and production activities, are positioned as follows (Figure 1).



Prepared by using [4; 5].

Figure 1. The specialisation of major objects of innovation infrastructure

The science park is not just commercializing the research results, but it also manages and disseminates the innovation. Nowadays, the successful science parks are transformed into *science cities*, on which territory are concentrated a several

research clusters, universities, government agencies for supporting the innovation process (France, Sweden, Spain).

Sometimes in researches paper we can find the concept of "technology zone" (especially in the USA), on its territory it may concentrated a several industrial parks, and accordingly, these zones provide the same benefits and services that are usually available for residents of technology park [5].

As a key instrument of improving the competitiveness of industries and regions, enhancing the innovative capacity and economic development in the medium and long term perspective *the cluster policy* is applying by every country of European Union.

The world practice demonstrates that in recent decades the formations of clusters are quite active. However, each country has its own national characteristics related with governmental policy in supporting and development of clusters.

Clusters have been actively created in the late 1990s in Germany and Finland, and by them it was followed by other European and Asian countries.

At the end of the 2000s in Europe it was even launched the international project of creating clusters (named European Research Area), the project concept was that the single European cluster is not enough its own strength of agglomeration for attracting additional resources. Authors of this project based on the idea that a lack of resources can be remedied by establishing strong international relationships.

The main focus of many researchers' papers from different countries made on the concept, that the concentration on one cluster's territory small, medium and large businesses provides a good chance of achievement the synergies effect of innovation development.

The clusters have been widespread in many countries, that it's happened they became an integral part of the Government Innovation Strategy. For instance, in France, 2005, it was launched a special program for the development of clusters - The Competitiveness Clusters Policy, which is mandated of merger companies, training centers, public and private research organizations for realization of innovation projects [6].

Some experts from different countries agreed that there is no single model for creating objects of innovation infrastructure. There are some models with national features in the international practice:

- *North American model* – it includes of the minimal government involvement and a high level of interaction between researches and production activities (Silicon Valley);

- *French-Japanese model* – it involves creating a huge technology parks, on the territory of which was concentrated a several other objects of innovation infrastructure;

- *Scandinavian model* - the creation of small parks and realization of national development programs, rather than participation in the international projects;

- *South European model* – the focus on the modernization of production and the creation of new positions for employees, which actively involves interstate European funds for creation of infrastructure.

Japanese model of "science parks" is different from the American model, suggesting the construction of entirely new cities "Technopolis" (since 1982 year the project is in realization process). According to this project it was created 19 zones, evenly distributed over the main Japanese islands. One of the most interesting projects of the Asian is a Japanese Tsukuba technopolis, arising in the empty place. It was started since late 1950s with the replicating an idea of the Soviet Union's science cities and American's Silicon Valley. In the 1970s a construction law of Tsukuba was passed, the creation of the technopolis took 20 years and 5.5 billion dollars of government funds. As a result, it became one of the largest cities in Japan, consists of: 27 square km, 180 000 citizens, 13 000 researchers, 59 research institutes, and more than 200 private companies. This project is focused on basic research since the mid 90s. Ministry of International Trade and Industry to allow private companies access to research equipment [7].

Nowadays, in Japan it became a shift from technopolis's era to a new cluster projects (industrial parks, New Technology-Based Firms (NTBFs) and others).

New Technology-Based Firms (NTBFs) have gained increasing economic relevance, supported by the recognition that they play an important role in the competitiveness of economies through the appearance of both new, high technology products and of new and emerging industries.

We can say about a great Japanese experience in the development of industrial parks abroad with international cooperation. For instance, the Industrial Park in India, it specially prepared for the Japanese manufacturers for the period 2010-2013 years. The investor and top-manager of the organization: Rajasthan State Industrial Development & Investment Corporation (RIICO). The total area is 472 hectares. The number of residents is 30 Japanese companies [8].

In 2001 year the Ministry of Economy, Trade and Industry elaborated the *Plan of Creation*

Industrial Clusters. According to this plan assumed a close cooperation of small and medium businesses with research institutions within each region in order to achieve a higher level of technological development and new business creation. With the support of the regional divisions of METI and private organizations it was created 19 projects in the country.

The Plan of Creation Industrial Clusters was developed for the period of 3 stages of its realization:

- First stage (2001-2005 years) - the initial period, the period of formation the industrial cluster;

- Second stage (2006-2010 years) - the period of industrial cluster growth;

- Third stage (2011-2020 years) - the period of self-sustaining development of industrial cluster [8].

According to this Plan the production structure of a particular region should be developed in a direction that allows one to use the product for the needs of the other several industries. Thus, among all the industries which represented in this area, it was established the stable relations that provide a support for these industries and promote economic stability in the region.

The phenomenon of cluster economy, the economic agglomeration of related companies on one territory, is known since traditional economy period. In the classic studies, the cluster - is a sustainable territorial and industrial partnership of enterprises and organizations of one or more interrelated industries.

Industrial cluster – is a community of economically closely related and closely spaced companies, mutually contributing to the overall development and growth of competitiveness of each other. Mainly it is an informal association of leading large companies with lots of small and medium enterprises, the creators of technology, communications and market institutions, interacting with each other within the same value chain, focusing on a limited territory and carrying out joint activities in the production and supply of certain types of products and services.

The basis of the New Economic Growth Strategy, aimed at achieving sustainable economic development in the long trend of depopulation, have been developed by the Ministry of Economy, Trade and Industry of Japan (METI) and published in June 2006. The New Growth Strategy with two other programs – the New National Energy Strategy and the Global Economic Strategy - was the basis of the current economic and industrial policy of the government and at the same time became a part of

the integrated national long-term reform program of Japan.

This New Strategy determines the direction of Japanese development in future decades, the main objectives and priorities of economic development (the forecast period is not specified).

Innovation became a sort of "national idea" in Japan, and such words combinations as "innovative development", "innovation cycle", "innovation policy" are very popular today.

A great importance in the cluster policy of Japan is given to the development of cooperation between private industrial companies, researches and academic institutions, and government organizations.

The specific features of Japanese cluster policy include active support of *venture business organizations*. The Japanese authorities consider that a lot of Western, especially American large clusters have grown from small venture companies.

One of successful example that demonstrates some features of Japanese policy of the clusters development is "Sapporo Valley". This cluster is one of the first great research and production associations which grown from the venture. The main feature is information technology and biotechnology of Hokkaido. In 2001, the "E-Silk Road Program" was developed, which aimed at developing cooperation with foreign partners - Seoul, Shanghai, Shenyang, Shenzhen, Hong Kong, Taiwan, India and Singapore.

As a result, nowadays the "Sapporo Valley" is a cluster with a steadily grown gross income that can be enter into a number of major software development centers in Asia in future.

In Japan, in addition to innovative clusters there is also a bio, IT clusters and clusters of traditional crafts.

In Japan, until recent days, the formation of industrial clusters was carried out only with the support of the central government, but currently regional authorities began actively participate in this process. Regional community has an opportunity to implement the cluster initiatives through its own resources, to create a new business venture and production. In this context, regional clusters appear as a new form of industrial concentration, in which universities, research institutes and corporate clusters actively cooperate. By this process the researches and developments of companies began to focus increasingly on commercial success, it was simplified the regulation of transactions with foreign researchers in order to promote cooperation and exchange of experience with the foreign universities and research institutes.

Currently, it was developed «Knowledge cluster initiative» program in Japan, which stimulates the development of clusters in 18 regions of the country in which regional universities acted as the basis of clusters defined by a network of small innovative firms and large industrial companies.

During the analysis of theoretical researches it was identified the importance of foreign government agencies and research institutions in the formation of the cluster strategy of territorial development and it was allowed to determine the main directions of industrial cluster economy of foreign countries (Table 1).

Table 1. The industrial directions of cluster economy in different countries

Industries	Countries
Electronic and communication technologies	Japan, Switzerland, Finland, USA
Construction and development	Finland, Belgium, Netherlands, Denmark, Germany, China
Agro-industry and food manufacture	Finland, Belgium, France, Italy, Netherlands, Germany, Bulgaria, Hungary
Oil & gas industries and chemical industries	Switzerland, Germany, Belgium, USA
Timber industry and paper industry	Finland, Norway
Textile Industry	Switzerland, Austria, Italy, Sweden, Finland, China
Healthcare	Sweden, Denmark, Switzerland, Netherlands, Israel
Transport	Netherlands, Norway, Ireland, Belgium, Finland, Germany, Japan
Power Industry	Norway, Finland, Sweden
Machine engineering	Italy, Germany, Norway, Ireland, Switzerland
Pharmaceutical industries	Denmark, India, Sweden, France, Italy, Germany
Bio-technologies and bio-resource industries	Netherlands, Austria, Great Britain, Norway

Prepared by using [8; 9; 10; 11].

Nowadays, there are a number of Venture Support Programs in Japan. Business startup requires various elements, including funds, credibility and management knowhow.

We made some overview of specific governmental support programs together with entrepreneurs' inquiries in Japan (Table 2).

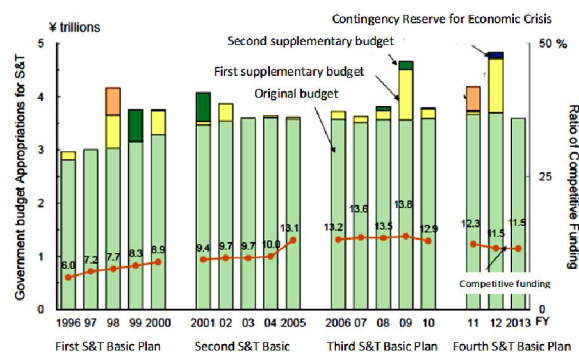
Table 2. Business startup support programs in Japan

I. Subsidy Programs	II. Preferential Investment and Tax Treatment	III. Loan Programs	IV. Management Consulting
1. Start-up Grants (this program subsidizes part of funds needed by young entrepreneurs to start local businesses based on existing family businesses)	1. Business Startup Support Fund (Under this program, private venture capital funds and other funds in which SME Support Japan invests provide support to venture businesses which are 5 years old or younger.	1. Funds to Enhance SME Business Capabilities Enhancement Support (this program provides low-interest loans to SME companies receiving support from certified support organizations)	1. Professional Support for New Business Creation Program (under this program, professionals, including top venture capitalists, lawyers and accountant provide support to venture businesses with strong growth potential)
2. Subsidy Program to Revitalize Small Business (this program supports development of new products and services and expansion of sales channels by small businesses)	2. Business Startup Support Tax Incentives (Angel Tax Incentives) (this program provides preferential tax treatment to investors investing in young companies)	2. New Business Startup Loan Program (this program provides unsecured, non-guaranteed loans of up to 15 million yen to persons planning to start a business which are second-phase old)	2. Business Creation Support (under this program, a portal site for matching of SME and people receiving support will be established)
	3. Investment by innovation Network Corporation of Japan (Under this program, Innovation Network Corporation of Japan invests in venture businesses and projects to commercialize cutting-edge technologies)	3. Guarantee related to Business Startup (this program guarantees loans up to 25 million yen borrowed by persons planning to start a business and companies which are 5 years old from private financial institutions)	3. Certifies Support Organizations (certified support organizations provide consulting service as easily accessible consultation windows based on The SME Business Capabilities Enhancement Support Act)
		4. Quasi-capital Funds (this program provides long-term, lump-sum redemption funds necessary for operating new businesses)	

Prepared by using [8; 12; 13; 14].

There are a number of modern aspects of government support of innovation process in Japan. During last decade the Japanese government elaborated some programs and plans for future planning the innovation in regions.

Science and Technology Basic Plans are based on the Science and technology Basic Act proclaimed in 1995. It is a basic plan for the systematic advancement of policies designed to promote science and technology (S&T). The Japanese Government creates it to realize S&T policy over five years (Figure 2).

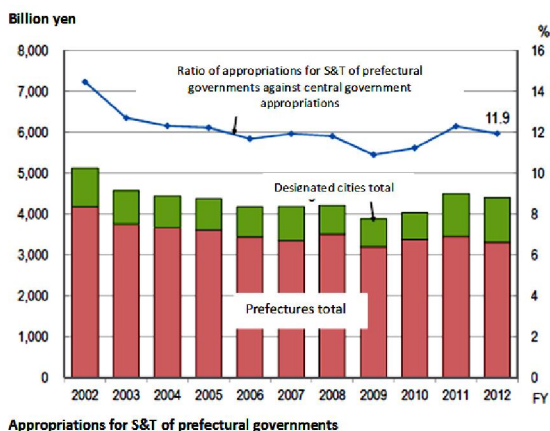


Prepared by using [12; 13; 14; 15].

Figure 2. Trend of the government budget appropriation for S&T under the science and technology basic plans

The First Science and Technology Basic Plan (1996-2000) budget was about 17 trillion yen. The Second Science and Technology Basic Plan (2001-2005) budget was about 24 trillion yen. The Third Science and Technology Basic Plan (2006-2010) budget was about 25 trillion yen. The Fourth Science and Technology Basic Plan (2011-2016) budget is about 30 trillion yen [12].

The ratio of competitive funding in the initial budget is 11.5%, which represents a decrease from the 2009 peak.



Prepared by using [12; 13; 14; 15].

Figure 3. Appropriations for S&T of the central and prefectural governments

For researching it is necessary to say that not only of the central government, but also of the local governments (Figure 3). The original government budget appropriation for S&T allocated by 47 prefectures and 20 designated cities was about 440.7 billion yen in 2012 [12]. This amount was the equivalent of 11.9% out of the original government budget appropriation for S&T allocated by the national government (about 3.7 trillion yen) in the same fiscal year.

Conclusion

Industrial clusters in Japan carry out innovative activities, such as research and development, and new business creation in new areas. The Plans for creation the industrial clusters last until 2020 years, and it is the current concept of regional policy in Japan.

Japanese experience shows that in a market economy, government support of regions remains a necessity of modern economy. They found

mechanisms of combination of direct and indirect methods to encourage and support the regions, as well as attracting private sector participation in government programs.

Cluster approach, which was developed in Japan in the framework of regional policy, interconnected with industrial policy of the country, carried out by the Ministry of Economy, Trade and Industry (METI). The Japanese economic system is based on planning, which is one of the most important elements of the state economic policy in Japan. This approach is the basis of the government strategy, defining its priorities, goals and resources.

With the beginning of the crisis period in the global economy, the Japanese government was actively involved in the economy, in particular to develop and implement anti-crisis programs and Business Startup Support Programs. It began to change the priorities of the government policy. The Japanese government has identified specific areas of support - social, regional policy and support for small and medium businesses, especially venture businesses. Regional policy based on cluster policy was elected as one of the priority element of support by the government in the crisis years, this support is provided with the help of additional budget.

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7/20/2014