

**2nd INTERNATIONAL WORKSHOP:
TOWARDS THE DEVELOPMENT OF AN R&D CLUSTER IN OKINAWA
OIST Graduate University, Onna-son, Okinawa, Japan
(29-30 March 2012)**

Summary of the Workshop

Introduction

Entrepreneurship is linked with job creation, GDP growth, and increases in long-term productivity. For many countries, self-sustaining economic development and social prosperity includes an environment where entrepreneurs, and the companies they create, are nurtured and allowed to thrive. The emergence of geographic clusters of globally competitive entrepreneurial companies and innovative institutions benefits local economies and seeds new industries. In Japan, the Okinawa Prefectural Government (OPG) is launching its next 10-year promotion plan (2012-2022), which includes policies and measures to create a suitable environment for entrepreneurship and reach self-sustaining economic growth. Linked with the establishment of the Okinawa Institute of Science and Technology (OIST), a new international graduate university, Okinawa aims to leverage its educational, social, and physical resources to develop into a global center for science and technology-based research and industrial development.

In collaboration with the OPG and with participation from other stakeholders in Okinawa development, OIST organized a series of workshops beginning in 2010 entitled “**Toward the Development of an R&D Cluster in Okinawa**”. Distinct from longstanding, government-led industrial cluster projects in Japan, the vision for development of an R&D cluster in Okinawa rests on two main principles: 1) **International**: leveraging Okinawa’s geographic location and cultural and historical background to connect the Prefecture to the Asian region and the world; and 2) **Entrepreneurial**: focusing resources and efforts to enhance the basic elements of the environment or ecosystem for entrepreneurship-based economic development. Workshop participants focus on practical and actionable ways to prepare the educational, financial, business, and policy environment in the Prefecture to support sustainable, new venture creation, with the overarching mission to engage government, academic, and industry leaders to coordinate and integrate their efforts toward the shared goal of developing Okinawa’s economy.

The **2nd R&D Cluster Workshop**, which took place March 29-30, 2012 on OIST’s campus in Onna-son, was attended by 40 experts in economic and industrial policy, higher education, entrepreneurship, and venture financing, from Okinawa, mainland Japan, and abroad. Divided into three Working Groups and led by a 10-member Steering Group, the participants identified opportunities for Okinawa to leverage its human, physical and natural resources, and recommended a number of immediate to long-term actionable objectives in three major areas:

- Strategies to Attract, Retain and Develop **Human Capital**
- **Financial and Business Resources** to Promote Entrepreneurship
- International and National **Networking and Physical Infrastructure Planning**

Findings and Recommendations

Industry, investors, universities, colleges, and governments each have the capacity to support the growth of local economies. Research has shown, and experts from the 1st and 2nd Workshops have emphasized, that the existence of an outstanding basic research institution is an essential element of a thriving R&D cluster. However, *any one entity acting alone or in isolation is insufficient to build and sustain the cluster.* Therefore, one key to success in this important endeavor is to coordinate and integrate the efforts of all stakeholders in Okinawa development.

Major Finding

There is an immediate need for an organization that is responsible for planning and coordinating action needed to enhance the environment in Okinawa for entrepreneurial R&D cluster development

A consistent finding that crossed the boundaries among the three working groups was that, while there exists a number of efforts to enhance R&D capabilities, there is a missing element in the future development of Okinawa: *an organization that is responsible for planning, coordinating, implementing, and monitoring programs related to R&D cluster development on a daily basis.* This organization would also serve to inform, engage, support, and stimulate development. The workshop participants outlined the minimum specifications of this organization:

1. **Autonomous Operation:** It is an independent legal entity, for example a non-profit foundation or promotion corporation, that is not owned by any government, university, or other organization, but whose success impacts them and Okinawa. Funding to operate and conduct the activities of the organization are multi-sourced, and not limited to government funds.
2. **Clear Purpose and Vision:** Its purpose, vision, and operations are clear; information is open and accessible; it prioritizes local stakeholder and community understanding, involvement, and acceptance, while also aiming to build a global brand for Okinawa as a hub of Asia and a gateway connecting Japan to the world.
3. **Governance with Local and International Representation:** It is governed by and accountable to an independent Board of Directors comprised of representatives of stakeholder organizations (prefectural and municipal governments, academic institutions, industry, other local community-based entities), as well as global leaders in the relevant fields including entrepreneurship and economic development.
4. **Highly Expert in Diverse Agenda:** It has sufficient resources and trained personnel to impact all aspects of the environment from business to finance, law, education and policy, and pursues many diverse projects simultaneously.
5. **Flexible and Results-Oriented Implementation:** It is focused on action and is empowered to be experimental in its activities. It is accountable for reaching measurable goals, established through benchmarking and metrics that are continually refined as the organization evolves.

The organization should be established through preparatory activities conducted by a task force (e.g. Hokki-nin-kai or preparation committee) that engages relevant stakeholders in government, industry, and academia. Such task force should be formed within the first half of the 2012 fiscal year, with the aim of launching the promotion organization by the end of fiscal year 2013.

Recommendations

In addition to forming an independent organization focused on R&D cluster development, another important finding is the need for a holistic approach to developing the entrepreneurial environment (human capital, business and financial services, networking, infrastructure, public relations, etc.), by implementing many practical and diverse projects in parallel. The workshop participants identified several programs that will have an impact over the short-, medium-, and long-term. Many of these programs could reasonably fall under the purview of the autonomous promotion organization discussed above, while others require particular stakeholder expertise and promotion.

Responsible stakeholders are identified for each recommendation:

G=Government, A=Academia, I=Industry, O=Autonomous Promotion Organization

I. Strategies to Attract, Retain and Develop Human Capital

1. Education

Whether it is improving health, harnessing clean energy or leading scientific discovery and technological innovation, the pipeline for future leaders in these and other areas depends on today's education in science, technology, engineering and math (STEM). Okinawa needs to strengthen its STEM education to improve its standing in Japan and to compete with other regions in Asia.

- 1.1 Create strong STEM programs in high schools in collaboration with universities (Super Science High School certification and unique SSH-like programs that can be replicated in Okinawan schools); analyze best practices from successful SSH programs in Japan. **[G, A]**
- 1.2 Strengthen the international competitiveness of Okinawan students by improving foreign language skills, global understanding, and access to information (Super English Language High School-like programs, improve teachers' skills in foreign languages). **[G, A]**
- 1.3 Strengthen informal education programs by developing existing and creating new K-12 science outreach programs at universities, including the Onna/OIST Children's School of Science, summer program in Marine Sciences, university faculty lectures at schools, public tours of academic research facilities, and others. **[A, O]**

- 1.4 Create a “Catch Them Young” Outreach Project that identifies the most promising students in Okinawa schools and provide them with access to specialized education and training programs in Okinawa, mainland Japan, and abroad [G, A, O]
- 1.5 Encourage and fund Okinawan students to participate in global science, technology, and engineering competitions (Intel International Science and Engineering Fair, RoboCup, iGEM, Google Code Jam, and others). [G, A, O]
- 1.6 Leverage the “Uchinanchu” (Okinawan) Global Network to develop human resources through support of educational programs, mentorship, and study abroad/exchange fellowship programs. [G, O]
- 1.7 Create a partnership among Okinawa institutions of higher education on the topic of Okinawa development to share information and coordinate activities; strategically link universities and technical colleges to the human capital needs of local industry. [A, I, O]

2. Recruitment

To be globally competitive, Okinawa universities and private companies will require access to the world’s best educators, scientists, engineers, and business leaders. Measures should be taken to encourage recruitment of high skilled workers from abroad. Okinawa can serve as a test-bed and example for innovative programs that help foreigners and their families better assimilate and contribute to the growth of Japan, while also making Okinawa more attractive and competitive for recruiting the best global talent.

- 2.1 Create high-quality international childcare, primary and secondary schools for local and foreign children. [G]
- 2.2 Support unique programs to identify and create job opportunities for foreign family members. [G, O]
- 2.3 Implement foreign language support for public services, including emergency information, transportation, and medical services. [G]

3. Entrepreneurship

Entrepreneurs pursue economic value by recognizing and leveraging opportunities. Successful entrepreneurship has multiple spillover benefits including job creation, human capital training, and as a source of motivation. Regions that aim to encourage sustainable economic development through new venture creation and growth should promote entrepreneurship as part of their strategy.

- 3.1 Reward action and experimentation: Publicize the success stories of grass-roots approaches to entrepreneurship training in Okinawa, such as the IT Frogs Project; encourage and fund similar pilot programs focused on biotechnology, marine science, and others. [G, I, O]
- 3.2 Stimulate competitive spirit and global exposure: Encourage Okinawan entrepreneurs to participate in existing start-up accelerator programs in Japan and abroad (Open Network Lab, Y Combinator, Start-Up Chile). [I, O]
- 3.3 Create an Okinawa entrepreneurial boot-camp that develops young talent. [G, A, I, O]
- 3.4 Create an Okinawa Youth Entrepreneurship Association to support the training and education of students on the topic of entrepreneurship; the Association can provide international experience

for science and technology-gifted and entrepreneur-minded youth. [G, I, O]

- 3.5 Create a Venture Development Foundation focused on both developing new ventures and on developing the entrepreneur through education, product development advice, customer and market analysis; consider programs that directly tap into extensive human capital resources in Okinawa, particularly the young and female populations. [G, I, O]
- 3.6 Build an advisor/mentor support system that can be shared among venture accelerators and other venture development programs; include experienced technology developers from Japan and abroad. [G, I, O]
- 3.7 Mitigate failure: consider flexible academic arrangements that allow researchers to take sabbaticals or temporary leave to create new ventures. [A]

II. Financial and Business Resources to Promote Entrepreneurship

4. Business Resources

An environment that supports entrepreneurship includes a large number of variables interacting in complex ways. There are basic elements that should be in place to nurture entrepreneurial aspirations or to reduce the barriers to realizing them. Understanding the basic business resources needed to support new ventures through various growth cycles is an important part of an economic development strategy.

- 4.1 Identify a niche market where Okinawa can be globally competitive (e.g.: aging/health foods, environment, biotechnology) and direct resources on building capacity in this sector; focus on expertise and problems that are local and therefore can be well understood. [G, I, O]
- 4.2 Aim to build centers of research excellence in Okinawa universities and colleges (World Premier Institute, Centers of Excellence, or other designation). [A]
- 4.3 Establish a support system to assist foreign companies and entrepreneurs interested in accessing the Japanese market (foreign language support, market analysis, business services). [G, I, O]
- 4.4 Build an open database and network of experts and services in intellectual property, technology assessment, global market analysis, accounting, IT, business valuation, etc., both in Japan and abroad, and make accessible to SMEs and entrepreneurs. [G, I, O]
- 4.5 Proactively uncover business opportunities and sources of funding by selecting large companies in Japan and identifying their specific needs. [G, A, I, O]
- 4.6 To seed a business network in Okinawa, recruit successful entrepreneurs, professionals and Uchinanchu or other supporters of Okinawa who wish to change their environment and relocate to Okinawa. [I, O]
- 4.7 Create an Open Resource Center containing pre-competitive technologies and research resources, focused on a particular field or industry, to promote collaboration, enhance innovation, and accelerate product development. [G, A, I, O]

5. Financial Resources

Enhancing education and specialized training in the absence of access to capital may result in the exodus of highly skilled talent to regions where they can capitalize on their skills. In an environment like Okinawa

with a limited local capital market, strategic efforts must be made to identify all elements of the deal flow, from seed to venture to exit, and pursue programs that holistically impact all stages. Okinawa companies should also aim for global markets and capital.

- 5.1 Create university/college-based venture funds. [G, A]
- 5.2 Create education and mentoring opportunities for future directors of venture funds in Okinawa by identifying experienced global venture capitalists to develop programs and provide mentoring. [G, I, O]
- 5.3 Establish a Kenmin Venture Toshi Club, (crowd funding platform for the Okinawan community), to encourage individuals to pledge funds to support projects developed by the local community and that benefit the local community. [I, O]
- 5.4 Establish benchmarks and metrics that publicly-funded venture companies and other investment organizations can use to evaluate the success of bio and hi-tech companies and that the government can use to evaluate the success of venture funds; get input from successful venture capitalists from abroad. [G, A, O]
- 5.5 Reach out to local politicians and policy makers to exchange information and communicate needs of industry; reach out to investors and corporations to communicate advantages and capabilities of Okinawan universities and companies. [I, O]
- 5.6 Create programs at universities that aim to develop professional business management and corporate finance personnel, particularly in venture financing, company and technology valuation, and market analysis. [A]
- 5.7 Conduct analysis of tax issues in Japan related to venture investing; identify regulatory barriers and support tax incentive measures. [G, O]

III. International and National Networking and Physical Infrastructure Planning

6. *Networking*

Okinawa has a long history from the Ryukyu Kingdom period of trade and bilateral relationships with other nations. Leveraging its geographic proximity to major Asian centers and this history of openness and international exchange, Okinawa should build strong global networks in pursuit of innovative partnerships that can lead to economic growth.

- 6.1 Attract and develop world-class, issue-based conferences such as the STS Forum and TED Conferences to draw diverse, international groups to visit Okinawa; organize a global young leaders forum. [G, A, I, O]
- 6.2 Identify and leverage opportunities to host global leaders in science and technology and business development in Okinawa, to coincide with their attendance at meetings/conferences in Japan and other Asian cities. [G, A, I, O]
- 6.3 Build mechanisms (databases and other information management tools) to identify and respond to funding opportunities, such as those provided by MEXT or METI, aimed at promoting academia-industry collaborations. [A, I, O]
- 6.4 Plug into the “Uchinanchu” (Okinawan) Global Network to promote Okinawa to the world.

Identify and cultivate connections with supporters of Okinawa in mainland Japan and abroad with specialized skills and expertise. [G, I, O]

- 6.5 Map the key local, national, international stakeholders and networks in specific sectors to illuminate potential partnerships and innovative coalitions; continuously reach out to academics, investors, entrepreneurs, policymakers, and other groups to search for new ideas in each category to help catalyze and seize future opportunities. [G, I, O]
- 6.6 To promote industry partnerships, organize professional and social networking events that encourage casual interactions among local business leaders. [I, O]
- 6.7 Develop pilot projects to link with Japanese organizations with a proven track record of developing strong international partnerships, such as the Fukuoka Silicon Sea Belt Project; build project-specific alliances with other leading research institutions in Asia. [A, O]
- 6.8 Engage relevant local SME networks and industry associations in cluster development initiatives; link existing Uruma City industrial incubation facilities and companies with translational research and resources available at universities. [G, I, O]

7. Infrastructure

The development of sophisticated infrastructure (buildings, roads, airports, etc.) is an important investment when it is closely linked to an economic development strategy that is constantly attuned to the conditions and needs of the region. Before considering new infrastructure projects, efforts should be made to maximize existing physical resources by improving access or by identifying new uses.

- 7.1 Create a “Transfer Zone” in the OIST future zone that bridges OIST-to-industry and industry-to-OIST via incubation and technology transfer. [G, A, I, O]
- 7.2 Promote co-location of local start-ups and companies inside university facilities; provide local companies with access to research resources at universities and public research institutions. [A, I, O]
- 7.3 Build a mechanism to efficiently identify and link the needs of local SMEs and venture firms, with R&D equipment and tools available at the Okinawa Industrial Technology Center, local universities and technical colleges. [G, O]
- 7.4 Careful consideration should be given to land use and city planning that balances anticipated cluster growth with strategic zoning; efficient land and air transportation should also be considered in parallel. [G]
- 7.5 Continue efforts to open the market for low cost carriers to compete to service Okinawa’s access to and from regions in Asia; explore measures to encourage direct access to destinations in the U.S., Europe, and Asia (e.g. Singapore). [G]
- 7.6 Develop the international terminal buildings of Naha Airport in a way that communicates Okinawa as a vibrant island and a place for collaboration among people. [G]

Measures to create an environment in Okinawa where entrepreneurial ventures are self-sustaining and contribute to the formation of a thriving research and development cluster serve to increase the Prefecture’s overall productivity and promote higher wages. Government support to boost Okinawa’s national and global



competitiveness is especially critical in areas where the market will not deliver optimum results on its own. These include investments in education and training and building leading infrastructure. It also includes legal, tax, and regulatory regimes that promote entrepreneurship and do not place an undue burden on those who wish to create new ventures in Okinawa. Academic institutions and the private sector also play critical roles in building overall competitiveness and productivity by supporting human capital development and satisfying unmet needs, both locally and globally. An autonomous promotion organization, whose responsibility is to enhance the environment in Okinawa for entrepreneurial R&D cluster development, is another critical part of this process. It must act independently and with a global vision, bringing energy and drive to its endeavors, while generating trust from stakeholders and the community. A needed first step for this promotion organization is to develop a roadmap for economic growth in Okinawa through science and technology. Implementation will require collaborative efforts by relevant stakeholders in the Prefecture to organize the resources that would be applied to many diverse development tasks. Success will be measured not only in achieving the final goals, but also by the intermediate benefits seen at each milestone achieved in the ensuing years.