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# PERIL OR PROMISE?—BUILDING A SCIENCE PARK IN CENTRAL TAIWAN

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**Summary:** This paper provided a case study of the impacts of an economic development project on two townships in central Taiwan. To fulfill President Chen's campaign promise in increasing Taiwan's innovation competitiveness and balancing regional development in a global economy, the central government approved and began constructing Central Taiwan Science Park expediently in 2002. Pressured to cooperate, local residents have endured the pains brought by this development such as the transformation in rural landscape, traffic jams, pollutions, and relocations. So far, residents have yet to realize and materialize the promises of such a development project. It is doubtful that such a "top down" policy would be ideal for the sustainable development of local areas. Moreover, through in-depth interviews, we documented how Taiwan's pursue in the global economic race has brought unequal impacts on some of its rural communities.

**Keywords:** science park, sustainable development, top down, social and environmental impacts

## Peril or Promise?—Building a Science Park in Central Taiwan

### INTRODUCTION

What is the most appropriate way to build consensus for an economic development project? If this development project is formulated and administered by a central government, how can a balance be struck between national goals and local demands? How can such a project be deemed sustainable? These are some common questions asked by students of sustainable development, and represent some of the issues that emerged during our research on building a Science Park in Taiwan.

Since last August, we have been researching the potential changes communities would go through under globalization. Gradually, we found ourselves fascinated by some of the questions surrounding the construction of a Science Park in central Taiwan. This Science Park has been one of the most talked-about economic development projects in Taiwan during the past five years, and its success could be critical for the country's future prospects in the semiconductor and consumer electronics industries. However, behind the often-praised planning and administrative efficiency in building the Park, we have observed that the locals—including some adjacent rural and urban areas as well as their residents—have endured some inequitable impacts brought on by this project. Although our research and data collection have not yet been completed, we are eager to share some of our preliminary findings and possible explanations with the conference audience; we would especially like to seek some suggestions on how best to explore and explain issues which emerged in our investigation.

### THE CASE: CENTRAL TAIWAN SCIENCE PARK<sup>1</sup>

The establishment of the Central Taiwan Science Park (hereafter abbreviated as CTSP) is intended to fulfill a campaign promise made by Taiwan president Chen Shui-Bian. A major reason for building a third Science Park<sup>2</sup> in Taiwan is to strengthen the economic competitiveness of the island country. During the past several decades, the economic development of Taiwan—once hailed as a “miracle”—has gone through large-scale and significant transformations. Many industries—labor-intensive ones first, followed by information technology (IT) and other high-tech industries—moved overseas, especially to Mainland China and other South Asian countries because of their abundant and cheaper labor supply and resources. The rise of the IT and semiconductor industries in China has been particularly worrisome to Taiwan, given the importance of these industries to the continued success of Taiwan's economy. To reverse the trend of industry relocation to China, President Chen and his administration decided to build another Science Park to retain and recruit high-tech companies as well as to encourage industrial upgrading and innovation. Since this Park would be located in central Taiwan, another of its main benefits is that it would help to balance regional development since the first two Science Parks were built in northern and southern Taiwan. With three

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<sup>1</sup> The following description of Central Taiwan Science Park is based on the materials provided by its official website (CTSP, 2006) as well as various newspaper and magazine reports.

<sup>2</sup> The first two Science Parks are Hsinchu Science Park and Southern Taiwan Science Park (STSP), established in 1980 and 1995, respectively.

Parks along the western coast, a technology region will be formed. Furthermore, besides economic productivity and growth, these Science Parks—the newly built CTSP in particular—will emphasize environmental protection and ecological preservation; hence, the vision is to form a Green Silicon Valley in Taiwan. This is recognized as a major economic—as well as political, given the hostile and sensitive atmosphere around both sides of the Taiwan Strait—policy of Chen’s administration.

To expedite the planning and construction process of the 413-hectares CTSP, the administration formulated and implemented a “one-stop service” plan. A provisional office dedicated exclusively to the CTSP—instead of many bureaucratic offices scattered throughout the government—is in charge of streamlining and integrating all the necessary administrative procedures. There are three Divisions in this provisional office, overseeing land acquisition, infrastructure construction, company recruitment, labor management, and other regulations. As expected, this “one-stop service” plan has indeed greatly shortened the time span for the construction and operation of the CTSP. It took only ten months and five days—according to the official CTSP website—from the groundbreaking to the grand opening of AU Optronics Corp, the third largest manufacturer of large-sized thin film transistor liquid crystal display panels (TFT-LCD) in the world. The recruitment of businesses to the CTSP has going well, currently there are 80 factories signed up, with a total investment of 15,774 billion (NT dollars) investment as of July, 2006. Besides AU, other major high-tech companies operating in the CTSP include ProMOS Technologies Inc., Winbond Electronic Corp.<sup>3</sup>, and American Corning. The two main industrial sectors

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<sup>3</sup> Both ProMOS and Winbond are 12-inch foundry manufacturers.

in the CTSP are Integrated Circuits (IC) and Optoelectronics.

The nearly 16,000 billion investment in the CTSP has been achieved in only four years, compared to 17 years for Hsinchu Science Park and seven years for SSTP, the first and second Science Parks in Taiwan, respectively. Besides the tax benefits offered by the government, the CTSP is attractive to high-tech companies because of its ideal location, superb transportation networks, and pleasant climate. Situated in the Taichung Basin, the CTSP covers border areas in both the Taya Village of Taichung County and the Shitun District of Taichung City. Taichung City is the third largest city in Taiwan, and its central location makes it easy to travel north to Taipei, the capital, or south to Kaohsiung, the second largest city. There are many transportation options for the Park—two nearby national highways; an international airport; Taichung Harbor; and Quji High Speed Railroad Station, all within a 30-minute drive. With the protection of Central Mountain, typhoons (i.e., hurricanes) seldom hit Taichung and adjacent regions, and the weather is mild and pleasant. Given the tremendous administrative support from the central government as well as its many ideal conditions, the CTSP is widely considered to be a superb economic development project, providing the next major advance for Taiwan’s high-tech industry.

## **RESEARCH QUESTIONS**

It should be noted that the establishment of the CTSP and its provisional office has been carried out under the supervision of the National Science Council (NSC),<sup>4</sup> one of the main offices in the Taiwanese

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<sup>4</sup> For those who are familiar with the Executive Branch of the United States government, the National Science Council in Taiwan is equivalent to the

government in charge of scientific and technological policy and development. However, as described earlier, the CTSP is located in both Taichung County and Taichung City, each of which has its own local government. Since the CTSP cannot be geographically isolated, it was necessary to build roads, houses, shops, and schools to accommodate Park employees who have gradually moved into the greater Taichung metropolitan area. In Taiwan, it is generally the responsibility of local governments to build roads and schools as well as to review and issue permits for developers of commercial and housing projects. It is obvious that the CTSP development project requires the cooperation and coordination between central and local governments. Given the strong leadership role of the central government in building the CTSP, a key question is whether this kind of “top down” development policy will accommodate local demands and meet local expectations.

Moreover, with any type of development, there must be some sort of social, economic, and environmental impacts on affected regions and residents. Given that the development process of the CTSP has been expedited, behind the “supreme administrative efficiency and government performance” (CTSP, 2006), what kind of price has been paid by local communities and their residents?

## **RESEARCH METHODS**

To answer these research questions, our investigation intended to cover communities in Taya village of Taichung County and the Shitun District of Taichung City, which are both adjacent to the CTSP. However, time constraint limited our research activities during

the past year to two Townships in Taya village. These two townships are the areas in Taya closest to the CTSP, and are ideal locations to document the environmental, economic, and social impacts of the CTSP on locals.

To research such impacts, we employed several research strategies. Using “CTSP” as a keyword, we searched several newspaper databases for relevant news reports to familiarize ourselves with local responses. We also examined the history of the Taya village to gain more knowledge about its traditions and culture, although few historical records could be found regarding the two townships. Our main research activity was to conduct several in-depth interviews with township administrators and local residents. In Taiwan, township administrators are generally considered to be local opinion leaders, and they are the first officials to deal with residents’ complaints or comments such as those related to the CTSP. We also talked to residents—the elders in particular because of their knowledge about the local history—to garner a wider range of opinions.

All the interviews were conducted from February to August 2006, and generally lasted about 60 to 70 minutes each. The interviews were not structured, although our discussions mostly centered on the construction and impacts of the CTSP. We conducted the interviews in Taiwanese, a popular dialect used by local residents, with occasional use of Mandarin, the official language. With the consent of our interviewees, we taped and transcribed the interviews. Since written Taiwanese is difficult to master and not part of formal school language courses, our assistants transcribed the interviews into written Mandarin. For this reasons, the quotes used in the rest of our article cannot be technically described as verbatim.

## PRELIMINARY FINDINGS

Since our data collection has not yet been completed, we consider the results presented here to be preliminary findings. We will discuss the impacts of the CTSP on the locals as well as the implications of this “top down” policy-making in the following respects:

### Perceptions of the CTSP

The two townships in which we conducted our interviews and made our observations are rural areas, with agricultural production as the major economic activity. Similar to advanced countries, agriculture in Taiwan is regarded as a declining economic sector, and the rural economy has been bleak and unstable. Given the promises of more jobs and a better economy that would result from building a Science Park, it is not difficult to see why the majority of residents we interviewed had a generally positive perception of the CTSP. Typical responses were “We need to build the CTSP to give our next generation a better future” or “We have to build the CTSP for our economy”.

Nevertheless, when asked further, we found that residents’ perceptions of the Science Park were in fact more nuanced. With the exception of some local leaders, most residents learned about the CTSP *after* the central government had already approved this development project. In other words, the locals were not consulted or given a chance to participate in the policymaking process. It is no wonder, then, that some residents told us: “What can you do? The (central) government already made the decision, and you cannot oppose it.” Or we often heard this comment: “The government said ‘do it!’, and we just

obligated.” Why did local residents not express their opinions—either positive or negative—to local administrators or higher-ups? Local residents stated that “the government made the decision; it’s for our future, so we accepted it.”

Even with the prevalence of positive attitudes toward the CTSP, it would be wrong to conclude that there has been zero opposition to this project. And based on our interviews, a main source of dispute involves the price of land acquisition.

### Disputes over land acquisition

According to its official website, the CTSP covers 413 hectares and is being developed in three phases (CTSP, 2006). As of August 2006, phase three of the construction is in progress. Similar to any development project, land acquisition is the first critical task to be dealt with. To understand the land disputes over building the CTSP, we have to learn a little bit about land ownership in the two townships.

Most of the land used to build this Park was public—it was the property of the Sugar Corporation, a government-owned company which possesses a great deal of land all over Taiwan originally used for sugar cane production. The Sugar Corporation was first established by the Japanese when Taiwan was still Japan’s colony from 1895 to 1945. After World War II, sugar cane production gradually waned, and some of the vacant land was rented out to the public. When the NSC began the planning for the CTSP, it was decided that most of the land acquired should be Sugar Corporation land, since it would be much easier and cheaper for the central government.

Thus, in one of the townships we investigated, approximately 13 households were forced to relocate

because they lived on land they rented from the Sugar Corporation which was to be used for the Park. It is not clear whether these households opposed this relocation vehemently, but we are sure they left involuntarily since they lived there for over twenty years. The central government gave these residents a modest amount of compensation, but no relocation service.

In addition to public land, some of the land used by the CTSP project was private. For example, to connect the Park to the main road of Taya village, the local government of Taichung County was asked to build new roads. To do this, some private land in the second township we visited was acquired. When the Taiwan government wishes to acquire private land for public projects—especially for building roads, a public good—land owners has little power to refuse. However, the compensation that land owners receive in return is generally lower than the amount they would receive if they sold their land on the open market. One farmer angrily told me his story: part of his land was acquired by the local government, and the road construction changed the local ecological conditions thereby making it more difficult for him to cultivate his land next to the road. Indeed, when the farmer showed us his land surrounding the road, no crops were being grown and the field was bare. Worse yet, the new road cut the township almost down the middle; greatly changing the rural landscape.

But if the land was needed for the Park itself, not the roads, land owners might not let the local government take their land. For instance, after some open discussion, residents in one neighborhood refused the land acquisition because they felt the government's compensation was not reasonable, i.e., too low. Their leader told us: "We want to support our

government, but the government must give us reasonable compensation... Although the CTSP is important for the economy, we have to make a living for ourselves." The problem is, the CTSP may engage in further expansion and require more land in the near future. Whether residents in this particular neighborhood will then be forced to relocate is an open question.

### **Pollution and Other Problems**

Besides disputes over land acquisition, local residents complained most about various pollution problems caused by building the CTSP. To build this Park expeditiously, construction took place day and night. Construction vehicles damaged the roads; competed with pedestrians, motorcyclists, and cars; and made a huge amount of noise during the night. Local residents vividly remembered sandstorms caused by the large trucks, and the traffic headaches caused by the seemingly endless number of trucks passing by. With major construction completed, these noise and air pollution problems are now under control.

Nevertheless, although the number of trucks may have been reduced, the number of cars has continued to rise since more Park employees have reported to work as the construction of some high-tech companies has been completed. The building of the CTSP may be progressing rapidly, but local governments have been slow in planning and constructing enough roads to effectively manage the heightened traffic flow. A common problem is this: the road inside the Park may be 60 meters wide, but it becomes only 30 meters wide outside the Park. Traffic jams during rush hour are no longer a novelty to locals; in fact, more and more cars are passing by, we were told. With more cars, the number of traffic accidents has increased as well.

In addition, residents told us that they could not watch TV because of poor reception, which they first noticed after the construction of the Park began. They wondered whether the high-tech factories being built inside the Park had affected the TV reception. After some communication with Park officials, the TV problem was solved after the Park installed some sort of equipment.

### **Economic Effects**

Although the pollution problem are still a concern to the locals, and some may wonder about the land acquisition issue, most of them would not dispute the fact that the CTSP has significantly increased the value of their land. Most high-tech factories in the Science Park are still under construction, and it is estimated that over thirty thousand people will gradually move into the greater Taichung metropolitan area in the next five years. Given this bright economic forecast, housing and commercial developments have boomed, and shops have mushroomed in the region. All of this heightened economic activity has increased land prices even more. Most residents we talked to confirmed this trend, and predicted that the government may have to pay more to acquire additional land in the future.

However, the often-discussed about benefit of the CTSP in terms of bringing more jobs into the region has yet to become a reality. Residents in the two townships recognized the fact that not everyone is qualified to work in a high-tech company, and a more reasonable expectation is to work in service sector jobs such as restaurant workers, guards, or janitors. But even those jobs have been contracted out, and residents we interviewed described the difficulty in finding a job: "...very few locals are working in the

CTSP because you need to pass the exam...even the job of janitor is controlled by some companies." This was a bitter revelation to locals since one of the promises made by the CTSP was to hire local residents whenever possible.

### **Changed place identity?**

There is no question that the CTSP has vastly transformed the landscape and economy of the two townships, but will their traditions and place identity be changed as well? The residents we talked to thought not. A major reason for this was expressed by one resident, who said: "Yes, the CTSP brought more people into the region, but most people chose to live in Taichung City, not our town. Why? Because we do not have enough houses here." But will more and more people moving in to affect the town's image? The resident stated that "this is an agricultural area, and the law limits the number of houses you can build here. If you want to build more houses, then the government has to do some regional re-planning."

In fact, the central government is currently working on such a regional development plan, and it is possible that certain areas in the two townships could be turned into residential or commercial areas. When asked whether they were worried that such development would change the identity and culture of their rural towns, residents we interviewed expressed no such concerns. They said "Changes are good, changes bring new opportunities" or "More development is good for the economy; we need new developments."

### **DISCUSSION**

Since we are in the middle of data collection and field



research, we are aware of the danger in drawing any premature conclusions at this point. Moreover, the building of the CTSP has affected both urban and rural areas in central Taiwan, and our intuition tells us that the impacts of the Science Park on these areas will be unequal. We cannot explore the urban vs. rural contrast here because of ongoing research. We are also searching for appropriate theoretical perspectives to help us organize and elucidate all the concepts found in our investigation. Still, our field research in the two townships in Taya village has pointed us to several important issues when examining the CTSP development project in rural Taiwan. The theme of this conference, sustainable development, provides us with a framework to make some tentative arguments.

A famous and much-popularized Brundtland definition of sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WECD 1987:43). When implementing such a project in developing countries, the questions of which party is most qualified to make decisions regarding how best to meet the current needs without jeopardizing future prospects is the key. Carley and Christie (2000) discussed the pros and cons of the “top down” and “bottom up” approach. Given various contexts, there is no single best strategy when applying these concepts in the real world. For our case, it is clear that the CTSP is a top down development project. A critical issue is whether this approach could be sustainable, as it is claimed to be by Park officials.

On paper, this top down strategy makes sense. The CTSP is being built to improve the economic competitiveness of the nation, and the project is urgently needed because the high-tech industry faces

cut-throat competition. Without the central government’s “one-stop service” efficiency, the construction and operation of some companies/factories inside the Park would have taken much longer. Speed is crucial for high-tech companies to innovate and survive amid global competition. However, speed has also created problems, and most of which are *local*.

The major argument for this Science Park is that it is needed to fulfill national interests, but the conflicts and benefits of this project are being played out within local contexts. There is no doubt that an economic development of such a scale will significantly transform the political and economic landscapes of local regions, and local needs and inputs must therefore be taken seriously. When discussing the epistemological dimension of sustainable development, Redclift (1987) emphasized the importance of local indigenous knowledge. He pointed out that one of the problems associated with the managerial approach to development is the universal application of scientific principles. Such thinking ignores the value of local knowledge and fails to take into account the wisdom and experiences of local people. This is why some local residents criticized the design of the Park by saying that the roads were not straight and level, and some Park areas were not contiguous. Whoever designed the Park obviously did not spend enough time listening to local residents in order to gain more in-depth knowledge about the local geography, soils, and environment. The CTSP is being built for the future of the country; thus, any sacrifice made by local people is considered necessary, even legitimate.

Therefore, those local residents who lived on rented public land which was designated for the Park construction had to be relocated, even though they

may have lived there all their lives. Although some residents refused to let the government acquire their land, their fate is still uncertain. We have yet to identify and interview those residents who were forced to relocate, but some preliminary evidence suggests that they are marginalized socially and economically. In other words, the impacts of the CTSP could have been unequally felt by those more vulnerable in this era of rapid globalization, just as Gore et al. reminded us when discussing the concept of social exclusion (2001).

Another issue worth further investigation and discussion is local governance. As described earlier, the realization of the CTSP requires cooperation between the central and local governments. However, with limited resources and personnel, local governments have faced considerable obstacles in carrying out some of the necessary tasks for the CTSP such as setting up the Park's transportation networks, i.e., those new roads connect the Park to the existing transportation options. This is why the construction *inside* the park may have gone on day and night; by contrast, the building of new roads for connections has progressed far more slowly. To fully realize the CTSP's potential, smoother and more effective communication between the central and the two local governments must be established.

Here, we want to take a detour and discuss one of the themes of this conference, namely whether region is an appropriate unit for researching sustainable development. As Redclift (1987) and Cloke (1989) pointed out, analyzing contested power relations is a useful framework for understanding the process of sustainable development and rural land use. How best to manage environmental and other resources, with sustainable principles in mind, is contested and argued in the context of local power relations. What

is ideal for local areas may not be appropriate for regional or national development, or vice versa. Based on our research, sustainable development has to be analyzed at the micro- as well as the macro-level. Whether region is a suitable unit for analyzing sustainable development is a context-dependent question; however, we also argue that the various level of political processes being played out in any development projects should not be ignored (Baker et al. 1997).

## CONCLUSIONS AND FUTURE PERSPECTIVES

Our ongoing research on the CTSP suggests that the effects of building a Science Park may be unequal in both geographic (i.e. rural vs. urban) and socioeconomic (i.e. those benefited vs. those relocated) respects. Moreover, the CTSP case indicates that without public participation (Redclift 1987, 1993), a managerial, top down approach may leave something to be desired with respect to sustainable development. In *Development as Freedom*, Sen stated that "the role of development is to enlarge and enhance the choices—freedoms—available to all" (1999:10). In our case study of the CTSP, we found that not everyone can make this choice, especially when national interests are the priority for a development project. Whether this national development may bring promised benefits to all is still an open question.

As stated in the very beginning of this paper, we understand that there are many issues to be clarified and many arguments to be sharpened. We plan to continue and complete our field research in the coming year, and currently, based on what we have learned from our interviews and study, we are

planning to carry out a survey project to further examine the impacts of the CTSP in the Taichung region. Through a detailed and in-depth case study approach, we hope to elucidate the struggle and conflicts that a developing country goes through in order to strike a balance between sustainable development and economic excellence under globalization.

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