

# **SUSTAINABLE DEVELOPMENT and GLOBAL COMMUNITY VOLUME XI**

**Strategic Issues for Sustainable Development  
Toward Methodology for Green Engineering  
Politics of Sustainability**

**Sustainable Social Experiences in Contemporary Life  
Cultural-Enhancing International Tourism  
An Ethic-Aesthetic Common Perspective**

**Incubating Intermediate Technology for Sustainable Development  
Sustainable Modeling of Sustainable City  
Neo-Pragmatic Solution to Structural Socio-Economic Problems  
Security of Territorial Development**

**Edited by**

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University of Windsor  
Canada**

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Tokyo International University  
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# **Sustainable Development and Global Community**

**Volume XI**

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## **Incubating Intermediate Technology for Sustainable Development**

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### **Abstract**

In this paper we discuss some of the internal and environmental factors that may help in the success of incubating IT small enterprises to reinforce a public sustainable development policy.

**Keywords:** Intermediate Incubation, Sustainable development

### **Introduction**

Sustainable development is a means to solve social problems by using available resources in an efficient wasteless way that permits a long term development of the society. Characterizing human activity, we cannot forget its emphasis on problem solving. Usually, problems and problem solving strategies are related with the degree of complexity of the society involved. Most affluent societies belong to the class of the most complex ones, in terms of social structure and functionality. Unfortunately we have witnessed how these developed societies have plundered the global resources and endangered the environment without any policy for long term sustainability. In this way they have left for the developing countries a very fragile environment and an extravagant, wasteful culture, that these countries try to imitate.

However it is possible to combine natural, human, technological and socioeconomic resources in different alternative ways to solve developing problems by using Intermediate Technologies (IT) that are not only environment friendly but resource rational on the long term. The IT is a labor-intensive but efficient technology that lends itself to be applied even in small-scale establishments. Then it is highly advantageous for our developing societies to select, among the alternative development modes, the one that makes an optimal use of IT and available natural and human resources minimizing the waste. This kind of policy would give way to a sustainable development of our societies. Therefore, the development of successful IT's is a crucial step in long term social problem solving.

Incubation, in the world, serves as an important catalyzer for the commercialization of research and technology and provides a 'laboratory' of sorts to promote entrepreneurship (CSES, 2002).



One way to promote the development of IT is the establishment of a program of technological incubation for new small IT enterprises in order to help the local business people with legal, financing and marketing services as well as a small operating infrastructure.<sup>11</sup>

In the 1980s the incubators essentially offered affordable space and shared facilities to carefully selected entrepreneurial groups. In the 1990s it was recognized the need for supplementing the workplace with counseling, skills enhancement and networking services to access professional support and seed capital, to the tenants within the facility and to the affiliates outside the facilities.

The number of businesses incubators are growing rapidly. Nowadays there are more incubators in developing and newly industrialized countries than in developed ones. Furthermore, countries tend to inflate numbers and to include certain planned facilities as business incubators. Because of that, what the start-up business need now is better incubation, not just more incubators (Lalkaka, 2006)

### **Incubation Success Factors**

A better IT incubation is possible through a better operation planning by considering the crucial factors that make the difference between a good IT project and a technological business. In this paper we focus on the factors that impact the incubation operation. The identified factors can be categorized in four groups: the IT technological product, the incubate, the incubator, and the external factors. Each one is going to be explained below.

**The technological product.** The ultimate goodwill of a new start-up is determined by the product rather than the technology, as the product is a more precise expression for what is to be offered to customers (Hongyi et al, 2007). The IT technological product should be characterized by a creative IT application complemented by an attractive industrial design in order to have favorable medium-long term results.

**The incubate.** The incubate includes the organization which has the product undergoing incubation. The entrepreneur's characteristics and the financial and consulting support seem to be the principal incubate factors that influence the incubation process. The entrepreneur's experience must be related with applying the necessary techniques for doing business in the particular industry. It is very important for new technological start-ups because the most important and critical task is to transform a technologist or a researcher into a businessman (Opekun, 2006; Hongyi et al, 2007).

**The incubator.** The incubator is the organization that encourages the formation and development of start-up businesses. The aims of incubators should correspond to the original sustainable development incubation objectives: creating employment,

<sup>11</sup> Acknowledgement: This work was supported in part by the project PAPIIT

stimulating long term economic activity through enterprises creation, realizing profits, encouraging IT transfer and commercialization, revitalizing disadvantaged areas or enterprise zones, diversifying the region's industries, promoting certain types of clusters or companies, and promoting certain population groups (Albert et al., 2004). The presence of internal business networks makes possible the mutual complementarities between incubates (Bollingtoft and Ulhoi, 2005) belonging to the same incubator. Therefore the incubator should provide the establishment of business networks between incubates, as well as basic structural resources like offices, parking, communications, computer resources, training, marketing and financial services.

The use of these basic support functions varies depending on the needs that correspond to the stage of development of each firm's business (Chan and Lau, 2005; Balthasar et al, 2000). Sharing these basic structural resources is generally applied to all incubated firms. The low rental seems to be a good reason for the incubated companies to join the program because of the lack of their own financial resources (Hongyi et al, 2007; Chan and Lau, 2005). Geographic proximity is also found to be related on how often technology founders seek consulting advice from incubator, particularly about certain areas they do not know (Chan and Lau, 2005).

**External factors.** The external factors are those aspects outside the incubation process that affect their operation like the IT market characteristics, the incubation sponsors, the government and the universities. The IT market characteristics are important at the post incubation process. These market characteristics are: the level of absorption of innovations at the level of enterprises and organizations of the region, and the purchasing power of the consumers of the innovations (Opekun, 2006).

Government at any level has a significant impact both positively when promoting supportive policy, and negatively with unclear and ambiguous strategies (Hongyi et al, 2007; Opekun, 2006; Albert et al, 2004). The formal liaison with universities have had a positive effect on the performance of some incubation programs (Smilor et al, 1988; Hongyi et al, 2007).

A systemic view of the relation between the factors is shown in figure 1.



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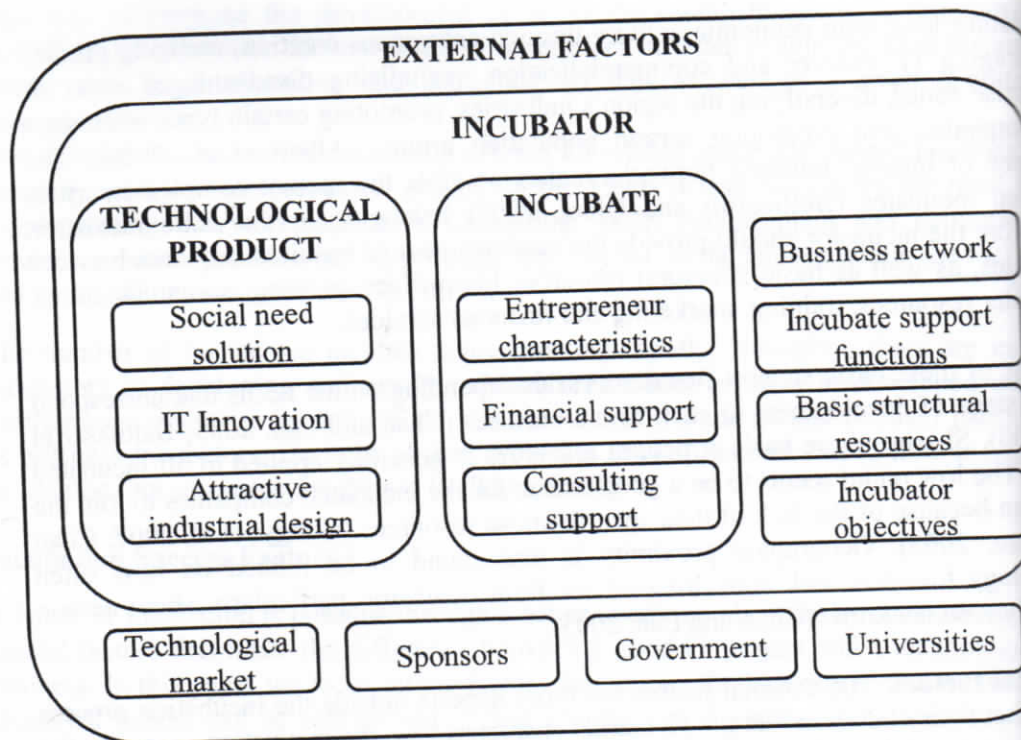


Figure 1. Incubation Factors

### Conclusion

This paper focuses on the incubation factors that represent significance at new business generation. Something interesting is that upon the contexts, some factors or could not affect the incubation results. For example, the university closeness is always important at the incubation process. We consider that the incubation environment at any level could make the difference between the success or the failure of the start-up; therefore the next research subject should be the development strategy to promote the IT business generation. Incubation of intermediate technology in Malaysia has areas of business opportunity in solid waste management, optimal use of resources such as water, power generation through alternative sources and hydroponics. All these star-ups would allow users to any enterprise level to reach sustainable development.

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