

LOCAL KNOWLEDGE AS A COMPETITIVE ADVANTAGE AND AN INNOVATION TOOL FOR REGIONAL PRODUCTION SYSTEMS: THE CASE OF THE NORTH AEGEAN REGION

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ABSTRACT

The embeddedness of local knowledge in the production process can be regarded as an innovation tool for enterprises, since it can result in the diversification of production, procedures, products and services and therefore act as a significant competitive advantage. The paths through which this can be achieved are questioned through the study of small food and beverages firms of the North Aegean Region. The enterprises of the Region consist a rather closed production system due to its insular character. Data were acquired through a research of 94 enterprises of the region, with a structured questionnaire. Results show that although tacit local knowledge is present, its embeddedness as innovation and competitive advantage is rather weak. This is a result of the region's locally oriented production system, which doesn't allow the translation of local knowledge into innovations although significant reserves survive; and also of external market pressures for standardization.

Key words: local knowledge, innovation, competitive advantage, North Aegean Region

1. INTRODUCTION

Local knowledge used to be the main if not the only, source of innovations for local enterprises in the past. The opening of local production systems to national and international trade systems has replaced local knowledge with external knowledge patterns when innovation is involved, resulting to the weakening of the mechanisms

that produce local knowledge, such as tradition and local culture. This paper explores the assumption that local knowledge can still serve as a significant resource and a tool for innovation for enterprises, offering significant competitive advantages. Such advantages result from quality improvement and diversification of products and services that local knowledge can offer. Local knowledge is a territorial located resource and a unique asset for both regions and enterprises. In this context, local knowledge can be seen as a part and at the same time an output of traditional cultures and its embeddedness in the production process can offer an important competitive advantage for enterprises and regions (figure 1.1). In this paper, some important theoretical issues of traditional knowledge are discussed and the results of a field study of small food and drinks enterprises of the North Aegean Region are presented. The Region is a relatively closed production system, characterised as less favoured area, (L.F.A.), due to its insularity and isolation. This fact, combined with the absence of enterprises' networks, clusters, or support structures, leads to a production system with relatively small external knowledge inputs.

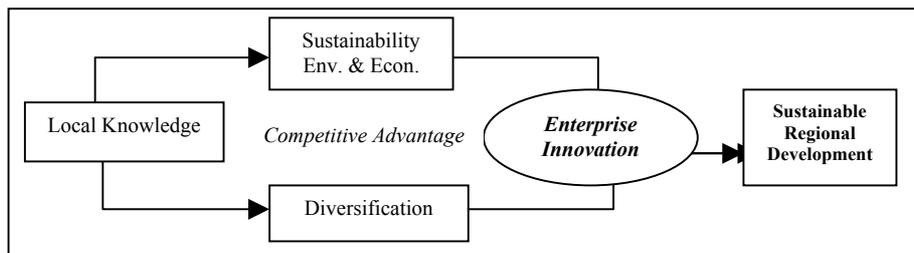


Figure 1.1: The main idea as a bilinear sequence

2. LOCAL KNOWLEDGE AS AN INNOVATION TOOL FOR REGIONAL PRODUCTION SYSTEMS

2.1. Local Cultures, Knowledge and Sustainability

Traditional (vernacular or territorial), local cultures are often perceived as positively associated with sustainable development for two sets of reasons [1]. The first reason relates to the pervasive assumption of the existence, in non-industrial societies in particular, of what Milton [2] terms as “primitive ecological wisdom”. Such wisdom is often assumed to vary inversely with the extent of traditional societies' external links. An example is offered by contrasting “ecosystemic” societies living within narrow range of

ecosystems upon which they depend for survival and towards which they are presumed to behave responsibly, and “biospheric” societies linked into global technological and trade systems and therefore less constrained to sustainable behaviour.

The assumption of a causal link between ecosystemicness and sustainability has come to be associated with anti-industrial sentiments and observations that “ecosystemic” populations do not radically modify their environments over time, and of the desire for solutions to sustainability problems. Clearly, primitive ecological wisdom is difficult to associate with non-traditional cultures, and modern anthropology has sought to undermine it on the grounds that humans “have no natural propensity for living sustainably with their environment” [2, p. 222]. Rather than a cultural goal, ecological benignness may be an incidental outcome of factors such as low population density, remoteness, or lack of access to trade and technology. Nevertheless, for a significant proportion of humanity until comparatively recently, traditional practices appear to have led to a long-standing, yet long-term productive, relationship with natural resources.

The second, more persuasive, set of reasons for viewing traditional cultures positively in the light of sustainable development, as Jenkins [1] highlights, results from the perception of such cultures as established “system(s) of values, beliefs, artifacts and artforms which sustain social organisation and rationalise action” [3, p. 90]. The systems view goes beyond cultures as collections of separable behavioural, perceptual and practical phenomena and appoints their self-organisation, structured and bounded relationships. By contrast, de-territorialised non-traditional cultures generally have negative associations with sustainability because of their shortcomings as systems [1].

2.2 Knowledge and Locality

Local Knowledge, as knowledge itself, is deeply spatially embedded, but at the same time an enterprise reality [4] on the degree that it is expressed through procedures of organization, production, products and services. Knowledge begins from people and it can't be created by itself, without the initiative of people and the dynamic interaction that takes place in a group of people (such as an enterprise, an organization or a community). However, local knowledge is crystallized at spatial

level and as a spatial characteristic is connected directly with a specific place. Therefore it can be considered as a spatially oriented human product and that locality is defined by knowledge and knowledge defines locality [5].

Knowledge is usually classified in two different types [6]: explicit and tacit knowledge. *Explicit* knowledge, which is formal and systematic and therefore can be easily communicated and shared, e.g. in product specifications or a scientific formula or a computer program [4]. *Tacit* knowledge on the other hand is highly personal. It is hard to formalize, and therefore, difficult to communicate to others, or in the words of the philosopher Michael Polanyi [6, p. 4], “We know more than we can tell”. Tacit knowledge is deeply rooted in action and in an individual’s commitment to a specific context – a craft or profession, a particular technology or product market, or the activities of a work group or team. At the same time, tacit knowledge seems to consist partly of technical skills – the kind of informal, hard-to-pin-down skills captured in the term “know-how”. It is often impossible to articulate the scientific or technical principles behind what we know.

The hypothesis that knowledge can become a tool for innovation and so a competitive advantage is well examined in the knowledge management literature. The work of Nonaka and Takeuchi [4] illustrates in the best way not only the importance and the necessity of managing knowledge, but also the way in which knowledge can become a product specification and so become embedded in the enterprises routines, into new products and services. They name [4] this way “the spiral of Knowledge” as the creation of new ideas and innovations, involves a procedure of knowledge transformation from tacit knowledge to explicit and then to tacit again which consist a knowledge spiral, [7], [4].

2.3 The Spiral of knowledge

According to Nonaka and Takeuchi [4], new knowledge and innovation are produced through the “spiral of knowledge”. The starting point of the knowledge spiral is usually a type of knowledge that is not so easily expressible and it always begins with the individual, such as tacit knowledge. The spiral includes four basic and different patterns of knowledge transformation:

1. ***From Tacit to Tacit:*** One individual shares tacit knowledge directly with another. Tacit skills are learned through observation, imitation and practice (apprenticeship).
2. ***From Explicit to Explicit:*** An individual can combine discrete pieces of explicit knowledge into a new whole.
3. ***From Tacit to Explicit:*** The foundations of Tacit knowledge are converted into explicit knowledge when they are used in the production process formulating something innovative or new.
4. ***From Explicit to Tacit:*** As new explicit knowledge is shared throughout an organization, other employees begin to internalize it-that is, they use it to broaden, extend, and reframe their own tacit knowledge.

The end point of that movement is explicit knowledge, embodied in new technologies and products. The Spiral takes on and on as explicit knowledge is taken for granted from the individuals and helps them to create new ideas through dynamic interaction.

2.4 Product Innovation

According to Nonaka [7, p.25] the essence of innovation is to “recreate the world according to a particular vision or ideal”. It signifies the transformation of scientific and technological knowledge into products and services, and in this sense the term describes a process [8]. However, when it designates a new product, then the emphasis is on the result of the process [9]. It is also true that innovation can be gained through diversity, and diversity can be the main input in the production process from the use of local knowledge. Local knowledge thus can create innovative products and local territorial conditions can encourage the process of knowledge creation as the essence of locality provides the common framework in which the members of a team interact, create and visualise new perspectives through conversation, exchange of experiences and observation.

Local knowledge is interposed between and transforms local resources to local products, (figure 2.1). The interaction between local resources and local knowledge is a two way procedure. The availability of resources defines local knowledge, which at the same time has the power to change the nature of the resources in order to produce local products. Furthermore, local products are defined and formatted with the use of local knowledge in the production process, but they also,

have the capability of changing the formula that they are made of, and so knowledge itself, when new products are created (radical innovation) or new specifications are needed (improvement innovation).



Figure 2.1: Local Knowledge in relationship to Resources and Products

As presented at figure 2.1, the space that is set between resources and knowledge is the space where sustainability is developed and mostly its environmental dimension, which concerns the use of local resources from local knowledge. Furthermore, the space that is set between knowledge and products, seems to be the space that innovation can be developed. By innovation, here, we imply the concept of economical sustainability, which is critical for the general sustainability of the enterprises and the regions.

3. THE CASE STUDY

3.1 The North Aegean Region

North Aegean Region is an insular Region with 3 Prefectures and 10 inhabited islands, 5 of which are big in size and population (Lesvos, Chios, Samos, Limnos, Ikaria) and 5 small (Agios Efstratios, Psara, Oinousses, Fournoi, Thimaina). Apart from inter-islands communication and transport difficulties due to insularity and great distances, in the big islands the relief (high mountains, steep slopes) creates intra-islands difficulties [10]. It stretches over 3.836 km², with a total population (2001) of 205.237 and population density of 52,1 inhabitants/km², when Greek average is 82,9. The population decline reached its peak in 1981 and since then the population is slightly increasing (1,9% in 1991-2001), but the quality indicators (age structure and employment) are deteriorating. For example in 2001, 21,3% of the inhabitants were older than 65, with Greece at 16,7%; and employment was reduced by 12,5% during 1988 – 2000 (from 67.600 to 59.100 employed).

3.2 The Regional Production System

The Region's GDP per capita stands at 92% of the national average (1999 data), against 79% in 1992, mainly due to the Samos Prefecture performance that stands at 109,7%, and is mainly owed to tourism, while the other two Prefectures stand at 85% and 88% (Chios and

Lesvos respectively). Agriculture covers a greater part of the Regional GDP than the Greek average (10% against 7,8% respectively), industry contribution is small while the services sector covers 71% (against 68% for Greece) mainly due to the importance of tourism, especially in Samos Prefecture [10]. A closer look on local enterprises reveals that food - beverages and tourism are the only local productive sectors (apart from trade) and account for almost 25% of the total of the number of enterprises and 17% of the total turnovers with food and drinks to cover 3,8% of the enterprises and almost 10% of the turnovers (trade is the predominate sector, covering 40% of the enterprises and 58% of the turnovers). The main land uses in the Region are groves (olive groves in Lesvos and Samos and mastic and citrus groves in Chios), vineyards (in Limnos and Samos) and grazelands in all islands, while arable land is important only in Limnos. Sheep and goat husbandry is also of great importance for most of the islands and especially for Lesvos, Limnos, Ikaria and Chios and most of the small islands. The main food and drinks products are olive oil, cheeses, wine, ouzo and mastic, all of which are produced with local raw materials with the exception of ouzo (produced with imported alcohol, [10]).

3.3 The Survey

The data presented here were acquired through a survey of 94 enterprises in the North Aegean Region. The data concern innovation, use of local resources, use of local knowledge and production of local products as well as the problems that enterprises face. Interviews with the use of a structured questionnaire were conducted from June to November 2002. The sample was chosen from the Enterprises Registry of the Prefectures and included enterprises that cover the main production profile of products produced in the Region (Table 3.1), such as olive oil, cheese, wines, Gum mastic, sweets, pasta, honey, juice and beverages, bread products and ouzo.

Table 3.1: Spatial Distribution of the Sample and Production Categories

Islands	Cheese	Olive Oil	Wine	Drinks	Other	Olive press	Total
Ikaria	1	-	2	1	4	-	8
Lesvos	17	10	-	-	14	8	49
Limnos	3	-	5	-	8	-	16
Samos	1	-	1	5	1	-	8
Chios	2	-	-	3	8	-	13
Total (N)	25	12	11	13	40	14	94
Total %	25,5%	10,6%	8,5%	9,6%	37,2%	8,5%	100%

3.4 Results

Results show that although the existence of tacit local knowledge is significant, its embeddedness in the production process is rather weak as regards products innovation and competitive advantages for the enterprises. This comes as a result of the ‘closed’ and locally oriented character of the production system of the region, which does not allow the translation of local knowledge into innovations although significant reserves survive (Table 3.2).

Table 3.2: How the knowledge of production process was first acquired and how it is transferred today

	First acquired		Transferred today	
	N	%	N	%
Family Tradition	41	43,6%	22	23,4%
Family & Education	2	2,1%	-	-
Apprenticeship	22	23,4%	25	26,6%
Vocational Training	3	3,1%	10	10,6%
Other	5	5,3%	5	5,3%
Experience	1	1,0%	-	-
Seminars	1	1,0%	-	-
Local Tradition	1	1,0%	-	-
Not answered	18	19,1%	32	34,0%
Total	94	100,0%	94	100,0%

The procedures through which local knowledge is transferred through generations has changed. In the past, family tradition was the most important procedure followed by apprenticeship. Today the importance of family tradition has declined by half and apprenticeship appears to be the main procedure, with vocational training coming third (Table 3.2). Results concerning innovation implemented demonstrate that only 33% of the total number of enterprises have actually introduced innovations, number similar to that of those who plan on introducing in the near future (Table 3.3). What should be noted here is the significant number of the enterprises that did not answered the innovation questions, as they did not know the meaning of the word or considered it as something that isn’t related to their everyday operation.

Table 3.3: Innovations Implemented and Planned

	Introduced innovations		Planning innovations	
	N	%	N	%
Yes	31	32,9%	30	31,9%
No	30	31,9%	26	27,6%
Not answered	33	35,1%	38	40,4%
Total	94	100%	94	100%

Data on the correspondence of enterprises with innovations to customers' demands can be used in order to understand the extroversion or the introversion of the regions' enterprises. Results show that the correspondence is very low (28,7%), with 53,1% of the enterprises declaring that they wouldn't introduce innovations after demand, which can be regarded as an indicator of the closed character of the production system of the Region. The categories of the innovations that have been introduced also demonstrate this closed character, as most innovations refer to standardization technology and/or safety designation schemes and only limited to production diversification of information acquiring for developing new or improved products (Table 3.4). What is also of importance is that the innovations introduced are limited in range and refer only or mostly to external knowledge or to knowledge bought. In fact only one enterprise declared that it actually utilized knowledge provided specifically for it and produced a new product.

Table 3.4. Product Innovations Categories

Innovation Categories*	N	%
Standardization	17	37,7%
Collection of raw materials	9	20,0%
Commerce	8	17,7%
Manufacturing	8	17,7%
Warehousing	3	6,6%
Total	45	100,0%

* Different categories can refer to the same enterprise

Reasons behind this limited range seem to lie again in the closed and locally oriented production system of the Region and thus the innovation 'shortage' appears to be both a cause and a result of the physical disadvantages of the Region. This belief is strongly defended by the owners of the enterprises in discussing the obstacles for introducing innovations. They feel that the physical disadvantages of the Region cause so many economic difficulties (increased costs, distribution difficulties, etc.) that innovation is way down on their agendas. Therefore, almost six out of ten believe that economic obstacles are the main reason behind this innovation 'shortage' and only 10% declare that they need more information on possible innovation pathways.

Data on the procedures that enterprises use in order to alter imported external knowledge in the moulds of locally produced or tacit knowledge, reveal that only 19% of them have gone into modified the

technology they import in favor of local or personal production techniques. This on one hand, may denote trust on this imported knowledge, but on the other, it may imply market standardization pressures, inadequate local diversification of procedures and products and inadequate utilization of local knowledge. It should be noted here that the majority of the enterprises that have modified the imported technology (almost 60%), stated that they have done so in order to modernize their production process, while only 20% stated that they introduced modifications in order to improve quality and 20% to reduce production cost.

3.5 Conclusion and Discussion

The data presented on the production system of the North Aegean indicate that:

- The region cannot develop knowledge and innovations and has to 'follow' developments in other areas, it is not a 'learning region'.
- This 'closed' and locally oriented production system preserves significant reserves of local and tacit knowledge.

This local tacit knowledge used to be transferred from generation to generation and was embedded in the production process, mainly through family tradition. Today, it is transferred mainly through apprenticeship. But the changes run deeper, as today local knowledge appears to be 'left out' of the production process and standardization lays the rules of production and possible innovation pathways, according to market or supplier of equipment pressures. This process affects local knowledge creation and transfer and despite the preservation of reserves, external knowledge threats are clear.

An attempt to schematize the above is presented in Figure 3.1, where the detachment of local knowledge from the innovation procedures is demonstrated. What should also be noted here is that the imports of external knowledge and the innovations introduced, can't really offer competitive advantages to the enterprises of the region, as the imports take place on a stage where such innovation patterns are already common place for the competition in other regions and local enterprises only struggle to catch up. These developments offer limited and unsustainable use of local resources and degrade local knowledge.

In a sense this short presentation has raised more issues than it has attempted to answer, as the results have clearly demonstrated that the

innovation pathways are very complicated, especially when issues of local knowledge are raised. In regions like the one examined here, with locally oriented production and little if any locally produced explicit innovative knowledge, significant reserves of local tacit knowledge appear to lie under the surface of standardization and import of innovation procedures. The data presented here offer some insight to this situation and indicate future research pathways into the mechanisms and support structures that could exploit these reserves and transform them into actual explicit knowledge and innovation generators that could improve the use of local resources and contribute to a local sustainable development strategy for the regions.

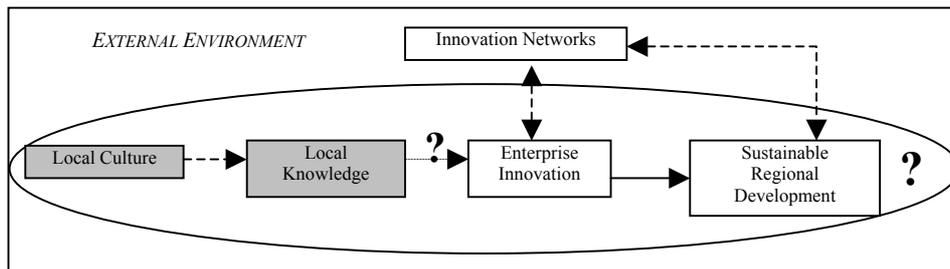


Figure 3.1: Production system of the North Aegean Region [5]

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BIBLIOGRAPHY

- [1] Jenkins, T.,N., (2000), "Putting postmodernity into practise: endogenous development and the role of traditional cultures in the rural development of marginal regions", *Ecological Economics*, 34, pp. 301-314
- [2] Milton, K., (1996), "Environmentalism and Cultural Theory", Routledge, London.
- [3] Norgaard, R., 1994. "Development Betrayed", Routledge, London.
- [4] Nonaka I., Takeuchi H., (1995), "The Knowledge Creating Company: How Japaness Companies Creates the Dynamics of Innovaion", Oxford University Press, New York.

- [5] Katsikis I., (2003) “Local knowledge, Enterprise Innovation and Sustainable Regional Development”, MSc thesis in Environmental Policy and Management, University of the Aegean, Mytilene, (in Greek).
- [6] Polanyi M., (1962), “Personal Knowledge: Towards a Post – Critical Philosophy”, University of Chicago Press, Chicago.
- [7] Nonaka I., (1991), “The Knowledge-Creating Company”, Harvard Business Review, November-December 1991, pp. 96–104.
- [8] EC, (1996), “Green Paper on Innovation”, Luxembourg.
- [9] Komninou N., (2002), “Intelligent Cities, Innovation, Knowledge Systems and Digital Spaces”, Spon Press, London.
- [10] Kizos Th., Vakoufaris H., Koulouri M., Spilani I., (2003), “Less Favored Areas, Specific- Character Products and Rural Development: Short Cheese Supply Chains in the North Aegean Region, Greece”, paper presented at the Conference: Less Favorite Areas (L.F.A.’s) and Strategies for Development, 21-22/11/2003, Mytilene, Lesvos, Greece.