Full Paper

STRATEGIC TECHNOLOGICAL ALLIANCES AMONG SELECTED FIRMS IN THE FOOD MANUFACTURING INDUSTRY IN SOUTHWESTERN NIGERIA

Y.A. Olagunju
The Polytechnic Ibadan

M.O. Ilori
African Institute for Science Policy and Innovation
Obafemi Awolowo University, Ile-Ife, Nigeria

B. A. Oluwale
African Institute for Science Policy and Innovation
Obafemi Awolowo University, Ile-Ife, Nigeria
adegbolaoluwale@gmail.com
boluwale@oauife.edu.ng
**corresponding author*

A.A. Oyewale
National Centre for Technology Management,
Obafemi Awolowo University, Ile-Ife,Nigeria

ABSTRACT

The study examined the nature and existing forms of Strategic Technological Alliances (STAs) among selected firms in food manufacturing industry in Southwestern Nigeria, and benefits derived therefrom. It was conducted in three states in Southwestern Nigeria, namely: Lagos, Ogun and Oyo. Multistage sampling method was used purposively to select 33 firms from the 99 firms in the 9 sub-sectoral groups of the food industry. Questionnaire was used to collect primary data from senior officials of the firms. The questionnaire elicited information on company profile, types of STA and STA effects. Personal interviews were also used to gather data from other staff members of the firms. Secondary data were collected from in-house journals of the firms and other publications. The data collected were analyzed with the aid of Standard Package for Social Scientists (SPSS). The results showed the existence of both technological and non-technological alliances in the firms. The alliances also involved both local and foreign firms, with R&D and licensing being the most popular STAs. Results also showed that R&D alliance was the most common local alliance in which 25% of the firms were involved while licensing was the most common foreign alliance (21.4%) among the firms. The study concluded that different forms of STAs were found among the firms and they offered many advantages to the firms.

Keywords: *Coopetition, Strategic Technology Alliance, Technology, Food Manufacturing Industry*

1. INTRODUCTION

Alliance formation among firms is now a common phenomenon, especially in the developed economies of the world. Hitherto, firms which are engaged in similar lines of business used to be involved in direct competition. The classical economists even said that competition was the driver of economic growth and development. They claimed that competition leads to optimum use of resources (Anderson, 1978). Based on this perceived importance of competition in economic development, firms have used various strategies to counter the efforts of their competitors. The firms never thought that there could be strength in pooling resources together to achieve common goals capable of enhancing their competitive advantage.

However, contemporary developments in the world economy, especially in the post-world war era, have shown that there is a great strength in firms mapping out collective strategies to achieve common advantages. Particularly, globalization and high cost of developing new technologies have now popularized the concept of coopetition among firms. "Coopetition" is cooperation plus competition (Turban et al., 2004). It is a situation where rival firms cooperate in some areas of business and possibly compete in others. This need for cooperation (or partnership) among rival firms have now led to the emergence of various alliances among firms, including Strategic Technological Alliances (STA). Indeed, several types of strategic alliance have been identified in the literature. Some of these include joint marketing/promotion, joint selling or distribution, production, design collaboration, technology licensing, research and development (Coopers and Lybrand, 1987; Elmuti and Kathawala, 2001). In Europe, for example, with the "motto" of "competition and cooperation", technology development has been the major motivation for strategic alliances (Nueno and Oosterveld, 1987). A strategic alliance was formed between Apple, Sony, Motorola, Philips, AT&T and Matsushita to form General Magic Corporation to develop Telescript Communications Software (Jacobini and McCreary, 1994). Numerous East-West strategic alliances have been formed for R&D purposes and to gain new markets.

However, in developing economies like Nigeria, STA appears unrecognized as a veritable tool for much talked about technological and economic development. One evidence of this is the virtual absence of functional government policy on science and technology, including technological alliance (Ogundipe, 2011). The Food and Beverage industry in Nigeria is at the fore in the manufacture of dairy products, hot beverages, seasonings, convenience foods, confectioneries and staple foods such as bread, pasta and noodles. The demand for the industry's products is estimated to be in excess of ₦500 billion per annum. The low purchasing power of the average Nigerian consumer, however, dictates that fortunes in the industry are highly dependent on the affordability of products. Recent studies in the food and beverage sub-sector of the Nigerian food industry have shown the existence of STA (Taiwo et al., 2002). There is, however, little or no information on the types, extent and benefits of STA among firms in the food industry in Southwestern Nigeria. This study is therefore designed to assess the state of STA among firms in the food industry in Southwestern Nigeria with a view to providing information on types, extent and benefits of STA among the firms. Specifically, it is designed to carry out an examination of the existing technological collaborative practices among food firms in Southwestern Nigeria with a view to discovering existing forms of STA, if any, among them. The study will

provide policy guidance on technological development through strategic technological alliances.

1.1. Strategic Alliance

Strategic Alliance (SA) is a long term commitment between one organization and another, who may be rivals in same market. Russ and Camp (1997) defined (SA) as a bilateral affiliation typified by the commitment of two or more partners to accomplish a common objective. It is a joint effort by two or more firms to build a common strength in a particular area – which in most cases is not the area of core competencies of partnering organizations (Wildeman, 1998).

Various developments in the world economy, especially in the last three decades, have impacted on the international business environment. These include globalization, high cost of developing new technology or R & D, need for complimentary specialized input and skills deregulations. Because of the difficulties being posed by these developments, many firms are now redesigning their strategies in order to remain competitive. As a result, many firms are now evolving various strategic alliances with their current competitors and potential competitors. An example of this is the technology transfer alliance for the purpose of access to larger markets between Rover (formerly British Leyland BL) and Honda (Dussauge et al., 1992). The purpose of the Rover-Honda alliance is to make Rover get access to leading-edge automobile designs and technology, while Honda gets access to the attractive European automobile market. These are just two of the reasons why firms may enter into SA. Other reasons include complimentary skill in R&D, economy of scale, reducing financial risks and the need to speed up product or process development (Wildeman, 1998 and Magun, 1996).

1.2. Typology of SAs

Rothaermel and Deeds (2006) observed three levels of alliances namely upstream alliances, horizontal alliances and downstream alliances. They claimed that firms could reach upstream in the product development process to tap into the basic, early stage research upon which a research project is based (upstream alliances). Firms could also reach out to other technology ventures to combine resources and technologies, which have reached the early stages of commercialization (horizontal alliances). The venture could approach downstream to access the manufacturing, regulatory and marketing knowledge that is required to move from a commercially feasible technology to a marketable product (downstream alliances).

Mothe and Voger (1996) opined that SAs are commonly formed in areas such as technology licensing, marketing assistance, distribution right, contract research, collaborative research, joint venture, personnel exchange and consortium membership. Licensing is an alliance in which a firm that has developed a technology allows another firm to use or exploit the technology for a period of time with the payment of royalty as specified by the agreement. For instance, Nestle (Nig) Plc and Nestle Company in London are involved in technology alliance on the production of food products. Joint venture, on the other hand, involves two or more firms coming together to effect a technological breakthrough. R & D alliance is one in which firms pool their research capabilities together to either create a new product or new technology.

But Adeniyi (2007) averred that of all the areas where strategic alliances are formed, technology and logistics appear to be the most common areas. Afemikhe (2003) also claimed that 80% of new technologies in developed economies are obtained through alliances. This may be as a result of the role technology can play in shaping competition and creating competitive advantage. Thus technology is a key element in all alliances (Dussauge et al., 1992).

1.3. Technology As A Tool For Creating Competitive Advantages

Robins and Coutler (1992) claimed that of all forces in the general environment, technology appears to be the most dynamic and pervasive. Many technologies have changed and are still changing in many markets today. Technology has become a potential instrument and major resource for forging competitiveness and competitive advantage in the world today. Ilori (2006) defined technology as a systematic knowledge for the manufacture of a product, for the application of a process or for rendering of a service, including any integrally associated managerial and marketing techniques. Many multinational firms are now dictating the pace of international business today because of their superior technologies. Technology is now regarded as a wealth creating resource in which those with better and superior technologies create products/services that make them to be competitive in the market better than those with less superior technologies.

1.4. Strategic Technology Alliances (STA)

The SA that is based on technological capability is known as Strategic Technological Alliance (STA). STA is a collaborative effort in which firms, with similar technological capabilities, establish collaborative working agreement among themselves, with a view to developing a technology or transferring one from one partner to the other. It is a relationship where firms cooperate on the basis of their technological capabilities, with their current or potential competitors (Dussauge et al., 1992). There are many forms of STA among firms. Dussauge et al. (1992) highlighted prominent STAs among firms in industrialized economies to include joint manufacturing, manufacturing licensing, technology transfer, cross licensing, R&D consortium and product development and manufacture. However, Magun (1996) observed that joint ventures (JV) and research consortia are the commonest STA among Canadian companies.

There are many reasons why STA may be adopted by firms. Among these are the need to develop new technologies or transfer new technologies, create access to new markets and reduce cost of researching into new products or technology (Dussauge et al., 1992). But Wildeman (1998) gave reducing time-to-market, reducing costs and increasing overall flexibility as reasons why firms may be involved in STA. STA is now playing an overwhelming role in technological development of industrialized countries, especially, because of new technologies which usually come from such alliances. This has enhanced national security and economic development of those countries (Dussauge et al., 1992). Because of this enhancement, governments of those countries are intervening by deliberately encouraging technological development through STA. This has led to many forms of STA. In developing economies, like Nigeria, little is known about the existence and types of STA. However, recent studies have shown the existence of some forms of STA in Nigeria, especially in the oil and gas industry. But there is little or no information on the types, nature of alliance partners and benefits of STA among firms in the food industry in Southwestern Nigeria. The motivation for this study is therefore to bridge this gap and thereby inform policy on the strategic technological alliances that could enhance productivity in the food manufacturing industry in Nigeria.

2. METHODOLOGY

The study was conducted among selected food firms in Lagos, Ogun and Oyo states in Southwestern Nigeria between April and October, 2010. These states have the highest concentration of food firms in Southwestern Nigeria. Taiwo et al. (2002) claimed that 53.5% of the Food Manufacturing Companies (FMCs) in Nigeria are located in Southwestern Nigeria, while 23.4% and 23.1% are located in Southeastern and Northern Nigeria respectively. A multistage sampling approach was used. Nine industrial groups, each with at least 10 firms were purposively selected from the 15 sub-sectoral groups listed in the food sub-sector of the Nigerian Industrial Directory (NID). A total of 33 firms were randomly selected from the 99 firms in the 9 selected groups registered with Manufacturers Association of Nigeria (MAN) in the study area. Questionnaire and interview method were used to collect primary data from the firms. The questionnaire, which consisted of structured and unstructured questions, were administered personally at each firm's level on the heads of Technical and Corporate Affairs/Administration

departments. Thirty-three questionnaire were distributed to the firms. Twenty-eight (28) were retrieved (84.85% retrieval rate) and analysed. The questionnaire was designed to elicit information on the existence and types of STA among the firms; as well as the alliance partners involved and the effects of STA on the firms. The data collected were analysed using descriptive statistics.

3. RESULTS AND DISCUSSIONS

3.1. Distribution Pattern Of Firms In The Study Area

From the interviews with workers in the selected food firms, it was observed that more food firms were located in Lagos state compared with other states in Southwestern Nigeria. Taiwo et al. (2002) reported that 53.5% of the food manufacturing companies (FMCs) in Nigeria are located in Lagos state. This pattern of distribution is not unexpected because many firms, including the FMCs might have chosen Lagos because it is the commercial nerve centre of the country. With a population of 14.6 million people (National Population Commission, 2010) and being a former federal capital of Nigeria, the state has potentials to attract establishment of firms, including food firms. However, the limited land space due to the Atlantic Ocean and the Lagos Lagoon have been forcing some firms to move northwards to the nearby states of Ogun and Oyo (Taiwo et al., 2002). Furthermore, cheaper land and lower tax rates also contributed to the spreading of the food firms to the neighbouring states.

Table 1: Distribution of Surveyed Firms in the Study Area

Sub-sectoral groups selected		No of firms selected from each state in study area			
		Lagos	Ogun	Oyo	Total
i.	Beer	1	1	1	3
ii.	Starch & Miscellaneous Food Products	3	1	1	5
iii.	Soft Drinks and Carbonated Water	3	1	1	5
iv.	Flour and Grain Milling	3	-	-	3
v.	Biscuit and Bakery Products	3	1	1	5
vi.	Animal Feeds	2	1	-	3
vii.	Sugar	2	1	-	3
viii.	Distillery and Blending of Spirits	1	1	1	3
ix.	Cocoa, Chocolate and Sugar Confectionery	1	1	1	3
Total		19	8	6	33

Source: Field Survey (2010)

3.2. Types of STA Among Surveyed Firms

Table 2 shows that the surveyed food firms were involved in various forms of STA at both local and foreign levels. The most common STA among the firms were: R&D Alliance (15.56% local and 5.88% foreign); Joint Venture (11.11% local and 11.76% foreign); Trade Channel Cooperation (11.11% local); Product Development and Manufacturing (8.8% local and 5.88% foreign); and Technology Transfer (6.67% local and 11.76% foreign). Mothe and Voyer (1996) also found out that there were many alliances which companies entered into in Canada. Moreover, that the STA among the firms involved both local and foreign alliance is also a confirmation of Ilori and Irefin (1997) who claimed that technology could be acquired from local and foreign alliances.

The fact that R & D and licensing alliances were the most common alliances in local and foreign contexts respectively agreed with Dussauge et al. (1992) in which out of 200 alliances formed by rival firms in manufacturing industries, 16% were R & D agreements, while 51% involved substantial R & D work and technology development. However, Magun (1996) has claimed that most alliances among Canadian companies included Joint Ventures (JV) research consortia and co-marketing, with JV predominating with 27%.

Table 2: Types of Alliances involved in by respondents

Type of Alliance	Nigeria		Foreign	
	Number of Alliance	Percentage of respondents	Number of Alliance	Percentage of respondents
Joint Venture	5	11.11	2	11.76
Licensing	1	2.22	6	35.29
Technology Transfer	3	6.67	2	11.76
R&D Alliance	7	15.56	1	5.88
Joint Manufacturing	3	6.67	1	5.88
Manufacturing Licensing	-	-	-	
Product Development and Manufacturing	4	8.89	1	5.88
Joint Product Development	3	6.67	-	-
Joint Marketing Operations	2	4.44	-	-
Trade channel Cooperation	5	11.11	-	-
Joint price Setting	1	2.22	-	-
Equity Alliance	3	6.67	2	11.76
Transport Logistics	4	8.89	-	-
Others	4	8.89	2	11.76

Source: Field Survey (2010)

One feature of any food industry is that consumers' tastes are always changing. Because of this, there is usually the need for the companies in the industry to carry out research in order to develop new products that could meet the changing tastes – the research could be by individual firm or by collaborative effort. This might be the reason for the preponderance of R & D alliances among the firms. Also, apart from using R & D alliances to bring into the market new products to meet changing tastes of consumers, other cost-reducing alliances, such as licensing could also be used. Licensing is a cost-reducing alliance in the sense that the cost of developing the new product is absent, since the cost of developing the new product has been borne by the licensor. This has been corroborated by Lang (1996) who claimed that small firms see licensing as a way of exploiting a technological advantage. This is because new technologies products developed by a large firm is made available and enjoyed by a small firm through licensing alliance among them. Wildeman (1998) has also opined that R & D alliances are usually formed by firms early in the product life cycle, while alliances for cost reduction are formed late in the product life cycle in order to reduce costs at that stage of the product life cycle. This may also explain why the two types of alliances are the most common among the firms surveyed.

Joint venture alliances are agreements between firms to jointly carry out a venture. The fact that this is common among Nigerian food firms may be a reflection of the growing realization of the importance of cooperation among them. This is the reason behind the joint venture between Ondo State Government of Nigeria and Quality Food Manufacturing Company Limited, Iwo Road, Ibadan on the training and production of pure honey.

The existence of both Nigerian and foreign alliances is a crucial result of this study. From Table 2, seven firms (15.56%) were involved in local R & D alliance, while one (5.88%) was involved in foreign alliance. Six firms (35.29%) were involved in foreign licensing, while one firm (2.22%) was involved in local licensing. From the above, it is clear that R & D alliance is the commonest local STA, while licensing is the commonest foreign STA among the firms. The prevalence of R & D alliances might be a reflection of growing collaboration among firms.

Nigeria's technological development is still low compared to the advanced countries of Europe and America, and the newly emerging economies of Asia. The prevalence of Foreign Licensing among the firms may be because the firms want to avail themselves of new technologies and products being developed by foreign firms through licensing. The firms have also been found to be involved in non-technological alliances. These include trade channel cooperation; Transport logistics, Equity alliances and Joint price setting. All these non-technological alliances are however at local level, and virtually none at foreign level. This may be because of the fact that foreign firms are mostly interested in technological alliances with little interest in non-technological alliances. Afenikhe (2003) claimed that 80% of new technologies in developed economies are obtained through technological alliances.

Besides, the interview with the officials of the firms have also revealed that the firms were involved in other alliances other than the ones stated in the questionnaire. These were mainly production cooperation, material processing (where a firm enters into an agreement with another firm to partly process its raw materials) and product packaging alliance, in which a firm packages the product of its client, as in the case of Fan Milk (Nig.) Plc Ibadan and Fuman Food Limited, also of Ibadan, Oyo State, Nigeria. The existence of these other alliances among the firms is in agreement with findings of Magun (1996) among Canadian firms where it was found that the Canadian firms also took part in several types of strategic partnerships.

3.3. Alliance Partners among the Firms

Table 3 presents the alliance partners among respondent firms. The result shows that most (30.77%) of the firms were involved in alliance mainly with their potential competitors. This is closely followed by alliance with foreign firms with 6 (23.08%). In a similar study, Praise and Henderson (2001) claimed that over 50% of organizations surveyed in USA admitted they were partnering with competitors. However, vertical alliances with distributors have been found to predominate among all strategic partnerships in Canada (Magun, 1996).

Table 3: Alliance Partners among Respondents

Types of Partners	Frequency	%
Current Competitors	2	7.69
Potential Competitors	8	30.77
R&D Organizations (Private)	0	0
R&D Organizations (Public)	2	7.69
Universities & Polytechnics	2	7.69
Government	3	11.54
Foreign Firms	6	23.08
Private Organizations	3	11.69

Source: Field Survey (2010)

The moderately high rate of strategic partnerships with foreign firms may be a reflection of continuing linkage between the firms (which were hitherto owned by foreigners), and their former owners. There were no alliances between the food firms and private R&D organizations and the level of their alliances with public R&D organizations and tertiary institutions were relatively low (7.69%) (Table 3). This result is contrary to Wong (1999) who claimed that in Singapore, research by Singapore's national R&D survey in 1992 and 1995 showed that tertiary institutions' research collaborations with industry increased from 154 cases in 1992 to 191 in 1995. The situation with the Nigerian food firms may be due to the fact that in the first place, very few reliable private R&D organizations exist in the country because of little focus on research, and the virtual non-existence of linkages between research organizations/institutions and industries in Nigeria (Ilori, 2006 and Ilori et al., 1999). The result has also shown that the firms may not be implementing technology-based strategies. Dussauge et al. (1992) claimed that firms implementing technology-based strategies usually have established close links with external sources of technology, such as universities' research laboratories.

3.4. Effects of STA on the Firms

Most of the firms surveyed explained that STAs have been of benefit to them. Among the benefits stated by the firms are that the STAs have made them to realize that cooperation, rather than direct competition is better; and that the STAs have brought several innovations into their activities. Table 4 shows the result of innovations brought about by STAs. Among the firms that have carried out only one innovation, majority (26.41%) carried out their innovation in improvement of their production method, 20.75% discovered entirely new products, while about 18.87% carried out improvement in product quality and discovered cheaper raw materials. With respect to those who carried out two innovations, most (28.57%) discovered entirely new products, 21.43% made improvements in their packaging, while 17.86% carried out improvements on their product qualities. This record of innovation agrees with Taiwo et al. (2002) who claimed that all the food companies surveyed have introduced at least one new process.

Table 4: Innovations resulting from involvement and non – involvement in STA

Types of innovation	No of innovation resulting from STA	No of innovations non – alliance
Improvement in product quality	19	7
Discovery of new product	20	3
Improvement in production method	18	4
Improvement in packaging method	17	8
Discovery of cheaper new raw materials	13	15
Fabrication of new machines	3	5
Evolvement of better marketing operations	3	1
Others	2	11

Source: Field Survey (2010)

4. CONCLUSION

The study established that the most prevalent STA among the food firms were R&D, licensing, and Joint Venture (JV) alliances. The study also established further that the STA among the firms cut across geographical boundaries. Consequently, there were local and foreign alliances. While R&D was the commonest form of local alliances among the firms, licensing was found to be a popular foreign alliance among them. The study also showed that most firms formed alliances with their potential competitors and foreign firms. Very few alliances were formed with private and public research institutions. The involvement of the firms in STA has also conferred some benefits on them such as improvement in the production method of some of the firms.

5. POLICY RECOMMENDATIONS

There is a need for the Nigerian government to come up with a deliberate policy on STA that will encourage and promote technology-based alliances, especially among firms in the food industry. Furthermore, government can also go into deliberate collaboration with some firms in the food industry. This could be made part of government policy on food security. For example, government can collaborate with firms in the processing of some food items such as rice, yam and maize. Apart from government, the firms, through their industrial associations, can encourage formation of STA among themselves. This will likely accelerate technological and economic development of the firms and the country. Other policies that can encourage STA among firms in food industry include provision of information on opportunities for STA formation and

giving incentives to firms which develop new technology/product through alliances.

REFERENCES

Adeniyi, A.A (2007): Forgoing Strategic Alliance for Corporate Competitiveness: Workshop paper on SME in Nigeria, Lagos 2007

Anderson, A. (1978): West African Economics, London, Prentice Hall Inc.

Afemikhe, S.O. (2003): The pursuit of value for money Ibadan, Spectrum Books Ltd.

Carayannis, E.G. (1998): The Strategic Management of Technological Learning in Project

Programme Management: The role of Etranets intranets and intelligent agent in knowledge Generation, Diffusion and Leveraging: Technovation, International Journal of Technology Management; 18, 699-715.

Cervantes, M. (1999): Public/Private Partnership in Science and Technology: an overview, STI Review No. 23 OECD P.4.

Coopers and Lybrand (19997): Strategic Alliance, Coopers and Lybrand Barometer, Spring.

Dussauge, P., Hart, S. and Ramanantsoa, B. (1992): Strategic Technology Management, New York: John Wiley and Sons Inc.

Elmuti, D., and Kathawala, Y. (2001): An overview of strategic alliances. Management Decision 39(3), 205-217.

Ilori M.O. (1999): Technological and Economic Assessment of Mushroom Cultivation in Nigeria. Ife Journal of Agriculture 20: 10-28.

Ilori M.O. (2006): From Science to Technology and Innovation Management, Ile Ife; Obafemi Awolowo University Press Ltd. Inaugural Lecture Series 191, Obafemi Awolowo University.

Ilori M.O. and Irefin I.A. (1997): Technology Decision Making in Organizations: Technovation, 17(3): 153-160.

Jacobini, S. and McCreary, K. (1994): Strategic alliances in high technology. The Red Herring, Vol.6, No. 2, p12.

Lang J.W. (1996): Strategic Alliance between Large and Small Technological Firms (The Small Firm Licensing Option) International Journal of Technology Management, 12, 796-807.

Magun S. (1996): Development of Strategic Alliance in Canadian Industries: A Micro Analysis: htt://www.ic.gc.ca/epic/site/eas.ns/en/rao1186e.html.Retrieved 15/10/2007

Mother D.J. and Voyer, R. (1996): Technological partnering and investment in Europe: the case of advanced electronic technologies in Canada Int. journal of Technology Management Vol. 2, 391-402.

Nueno, P., and Oosteveld, J.P. (1987): Categories of Technology Alliances. IESE Business School Working Paper WP-128.

Ogundipe, O.T. (2011): Communiqué on the 41st Meeting of Committee of Deans of Postgraduate Schools in Nigerian Universities held at the University of Lagos, Akoka, Lagos, between 7th and 10th March, 2011. The Punch 22, Vol. 17, No 20849, pp52

Praise, S. and Henderson, J.S. (2000): Knowledge Resource exchange in strategic alliances IBM systems journal vol.40; No 4, pp 1-13

Robbins, S.P. and Conster, Cowter, M. (1999): Management Sixth Edition Prentice Hall Inc, New Jersey: Prentice Hall Inc.

Rothaermel F. T. and Deeds D. L. (2006): Alliance type, alliance experience and alliance management capability in high-technology ventures. Journal of Business Venturing 21: 429-460

Russ, M. and Camps, S.M., (1997): Strategic Alliances and Technological Transfer an extended Paradigm, *International Journal of Technology Management*, 14, 513-527.

Taiwo, K.A., Olalere, W.O., Ilori, M.O., and Akanbi, C.T. (2002): A Study on the Nigerian Food Industry and the Impact of Technological Changes on the Small-Scale Food Enterprises. *Food Reviews International*, 18, 234-261.

Turban, E. Mclean, E. and Wetherbe, J. (2004): Information Technology for Management 4th Edition, New York. John Wiley and Sons Inc.

Wildeman, l. (1998): Alliance and Networks: The next generation. Int. Journal of Technology Management 15, 96-108

Wong, R.K. (1999): University-Industry Technological Collaboration in Singapore: Emerging patterns and Industry Concerns International Journal of Technological Management 18, 270-284.