

Incorporating Small Farmers in the Agricultural Supply Chain: A Pastoral View of Bangladesh

Omar Faruq

Assistant Professor, Dept. of Business Administration, East West University, Dhaka, Bangladesh

M Sayeed Alam

Dept. of Business Administration, East West University, Dhaka, Bangladesh

Sabina Sharmin

Associate Professor, Department of Statistics, Biostatistics & Informatics, University of Dhaka, Bangladesh

Abstract: *In Bangladesh, approximately 52% of the workforce is employed in the agricultural sector. This study is based on the rural rice farmers of Bangladesh who are a major player of this sector, but are caught in the middle of illiteracy and deprivation. The majority of these rice farmers remains landless and commonly uses antediluvian methods of farming. Despite the now established fact in Supply Chain Management (SCM) paradigm that greater coordination among the chain actors can improve overall efficiency of the chain, by benefiting each stakeholder, and thereby improving competitiveness of market economy, the rice farmer in Bangladesh vis-a-vis the producer is not a member of the supply chain. There is no specific path of material flow nor is there a relation among the members of the supply chain governed by the demand- supply equation. A collaborative model is suggested where an improved balance of power will be established between farmers and other members in the supply chain in Bangladesh. The suggested model would ensure that the material flow is governed by the market condition, option for bypassing material flow would be less, therefore option for hoarding and artificial price increase would be limited.*

Key words: Supply chain collaboration, small farmer, Bangladesh

Introduction

Supply chain collaboration is a new school of thought in supply chain literature (Mitropoulos A. et al.; 2007; Becker et al., 2004; McLaren et al., 2002). Collaborative supply chain relationship means integration of inter-organizational relationship; today it is an established fact that the proactive management of such relationships can prove to be an important competitive advantage (Dyer and Singh, 1998; Sahay, 2003; Power, 2005). In recent times the span of collaboration goes beyond normal commercial relationships which involve organizations and enterprises working together (Matopoulos A et al; 2007). This implies that the chain members become involved and work together in coordination activities, which extends the boundary of their organization, in order to satisfy customers' needs (Bowersox, 1990; Mentzer et al., 2000; Muchstadt et al., 2001).

In the last decade, there has been a major transformation in the *modus operandi* of enterprises from the traditional physical distribution channel to supply chain management (SCM). The purpose is to have greater collaboration among the members in the upstream and downstream in order to ensure higher value to the customers. It has widely been reported in the literature that, collaboration in supply chain management to ensure sustainable competitive advantage is no more an option, but a necessity (Lewis, 1990; Lamming, 1993; Hines, 1994; Gattorna and Walters, 1996; Christopher, 1998; Gunasekaran et al., 2001).

In the Bangladesh context, there has been widespread discussion on the issues of poverty being suffered by 'small farmers' termed otherwise as 'marginalized' or 'landless'. This paper will offer a completely new dimension of thinking in the line that 'participation' of the 'small farmers' in the supply chain management has the potential to add value to this bottom of the pyramid.

Relevant Literature: What is Supply Chain Collaboration?

Earlier in 1995 Spekman and Sawhney and in 1996 Brandenburger and Nalebuff initiated a stream of literature in the field of Strategic Management to focus on the importance of supply chain collaboration (as cited in Matopoulos, 2007). Lately, Andraski (1999), Anderson and Lee (1999, 2001) McCarthy and Golicic (2002) elaborate further on the importance of supply chain collaboration from micro and macro perspectives separately in the body of supply chain literature. (Stanton and Burkink, 2008).

Macneil (1981), comments that previously spot market transactions were discrete in nature that now has transformed into a relational exchange, where the roles of the supplier and buyer are no longer narrowly defined in terms of the simple transfer of ownership of products (as cited in Matopoulos, 2007). Collaboration evolves with increasing importance as enterprises recognize operating alone is not sufficient to resolve common problems and to achieve the desired goals (Huxham, 1996; Corbett et al., 1999; Barratt and Oliveira, 2001; Wagner et al., 2002).

Anatomy of Supply Chain Collaboration

Supply chain collaboration is classified into two main parts. The first one involves three-step process: firstly, selecting the appropriate partner based on the expectations, perceived benefits and drawbacks, and the "business fit" of companies; secondly, deciding on the "width" of collaboration; then thirdly, on the "depth" of collaboration (Sahay, 2003; Chopra and Meindl, 2001; Fawcett and Magnan, 2002; Chopra and Meindl, 2001; Fawcett and Magnan, 2002). The combination of those three elements comprises the intensity of collaboration. The more the depth (from operational to tactical and strategic), the width (from simple supply chain activities to more complex such as new product development) and the number of entities (two or more entities, upstream-downstream) the more intense the collaboration is. Finally, another important issue remains to be addressed, i.e., selecting the appropriate technique and technology to support the IT platform of the organization since not all potential collaborators are able to meet the requirements of collaboration in terms of technology and techniques.

The second part of supply chain collaboration deals with the establishment and maintenance of supply chain relationships. It includes the less tangible, but equally important, elements of relationships; for instance- mutuality of benefits, risk, and rewards sharing (Stank et al., 1999; Barratt and Oliveira, 2001). The balance between risk and reward sharing is one of the crucial factors to decide on collaboration issue. La Londe (2002) argues that trust and risk issues are very important in supply chain relationships because of the interdependency among the actors in the value chain. Some authors (Dapiran and Hogarth-Scott, 2003; Handfield and Bechtel, 2004) opine that 'interdependency' if not 'mutual' rather a 'power gap' exists, then, that will have a negative influence on trust and collaboration as a whole.

Barriers to Effective Supply Chain Collaboration

Most of the barriers of agro-food supply chain collaboration attribute to the complex and heterogeneous structure of the industry. A typical agro-food supply chain may consist of a number of entities linked from “farm to fork”, such as farmers, input suppliers, co-operatives, pack-houses, transporters, exporters, importers, wholesalers, retailers, and finally consumers. (Matopoulos et al., 2004). With the increase in the number of entities participating in the supply chain, information exchange becomes problematic, hindering supply chain collaboration, as companies often do not have compatible systems for information exchange.

Another important barrier for collaboration is the high degree of diversity of the entities in the supply chain. Companies’ differ in terms of economic size, structure, and access to ICT applications, which may add on collaboration barrier due to power-trust conflict, operational complexity or technical reasons. (Matopoulos et al.,2007). In a study done on UK beef industry, Simons et al. (2003) and Cox and Chicksand (2005) reveal some barriers to achieving effective SCM: the traditional way of thinking of the producers; and the tendency to abuse power by the multiple retailers.

Some authors find trust as an important coordination mechanism, reducing uncertainty and enabling collaboration (Bradach and Eccles 1989, as cited in Cox et al 2007; Emmett and Crocker, 2006), and it is increasingly given more importance as competitive advantage (Ring and van de Ven, 1992 as cited in Cox et al 2007; Sako, 2000).

Cox (1997, 1999) and Cox et al (2002, 2003) report on the historical lack of trust or the imbalance of power between the multiple retailers and the processors and farmers (as cited in Cox et al 2007). Taylor (2006) supports the findings of Cox et al and comments that the abuse of power by the multiple retailers has caused the supply input prices to go down; in addition to continual threat of switching if suppliers do not comply. Therefore, this lack of trust discourages investment and acts as a barrier to supply chain cooperation.

Methodology

By the term ‘small farmer’ we mean the farmers who do not own any land and work on others’ land primarily on the basis of a ‘crop sharing’ agreement. The sample of this study consists of a homogeneous group of farmers; where homogeneity is defined in terms of type of crop production (rice only), nature of work (manual and unskilled), standard of living and life style.

The study conducted in-depth interviews with the homogeneous cluster of 30 small farmers of rural Bangladesh. The rural area is located almost 350 km away from the capital and 30 km from the nearest town. The model proposed in this study, reflect *per se* the context of small farmers prevailing in rural Bangladesh.

Objectives of the Study

This study aims at the following objectives:

1. To portray a model of SCM currently in practice in the rural Bangladesh
2. To suggest a new model of SCM to shift the bargaining power onto the farmers’ side.

Research Findings: Average profile of the farmer

Average starting age for working: 20 years;

Average starting age for family life: 25 years;

Average daily income is BDT 100 - 120 (with lunch facility) and it is BDT 150 - 200 (if no lunch is provided);

Average number of children is 3;

Average savings at the end of month : nil;

Average working hour is 10 hours/day with no weekly break during cultivation time.

Farmers' Wages

In the rural area, there are two crops per year in Bangladesh. Average production of paddy is 1800 kg/acre (1 acre = 3 Bigha). Farmers worked for 30 days for cutting paddy of 2.31 acre . Total amount of paddy was 4158 kg/2.31 acre. Farmers remuneration is as if one farmer cut 46 kg of paddy he get 6 kg out of this. So total remuneration in paddy amount is 540 kg for work for 2.31 acre. Total Rice per kg paddy is 0.625 kg. So in terms of rice a farmer get 335 kg (tentative) rice. Farmer's wage is paid not in cash, rather in terms of paddy. For working two seasons in a year total benefit in rice is 770 kg of rice (tentative). Average annual rice requirement in a four members family is 1000 kg which leaves an average deficit of 230 kg rice. Considering price per kg is 30 taka, in monetary term the deficit stands at 6900 taka for working 2.31 acre. So incremental deficit per acre is around 3000 taka.

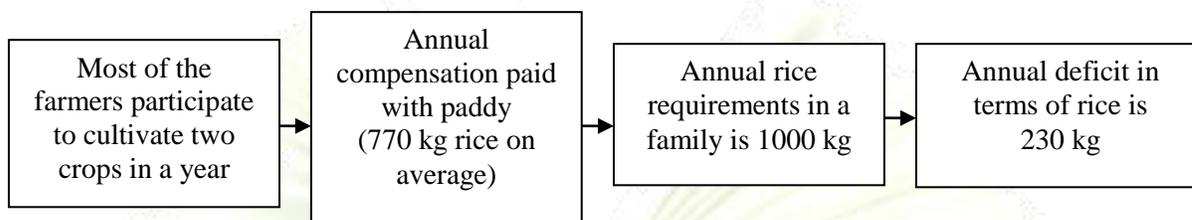


Figure 1

Producer Profit

With rice production of 1125 kg/acre and price 30 BDT/kg, total revenue stands at 33,750 BDT/acre. If production cost is 5,000 BDT/acre, the profit is approximately 28,000 BDT/acre.

Present Supply Chain Scenario

The Farmer, despite being the core participant in crop production, is not a member of the existing supply chain. Virtually there is no link or collaboration between or among the players in the supply chain. This means that the local retailer does not purchase regularly from the same local producer nor the local mill owner buys paddy from the same local retailer. Same is true for the local mill owner and the urban wholesaler. The existing relation is primarily demand driven and not cooperation driven. There exists opportunity for the local producer to go to the local mill owner bypassing the local retailer or for the local retailer to contact directly the urban wholesaler bypassing the local mill owner. In the present practice, since there is no linkage between the members, the wholesalers enjoy unrivalled bargaining power over the market condition to buy and stock and create artificial crisis to increase price.

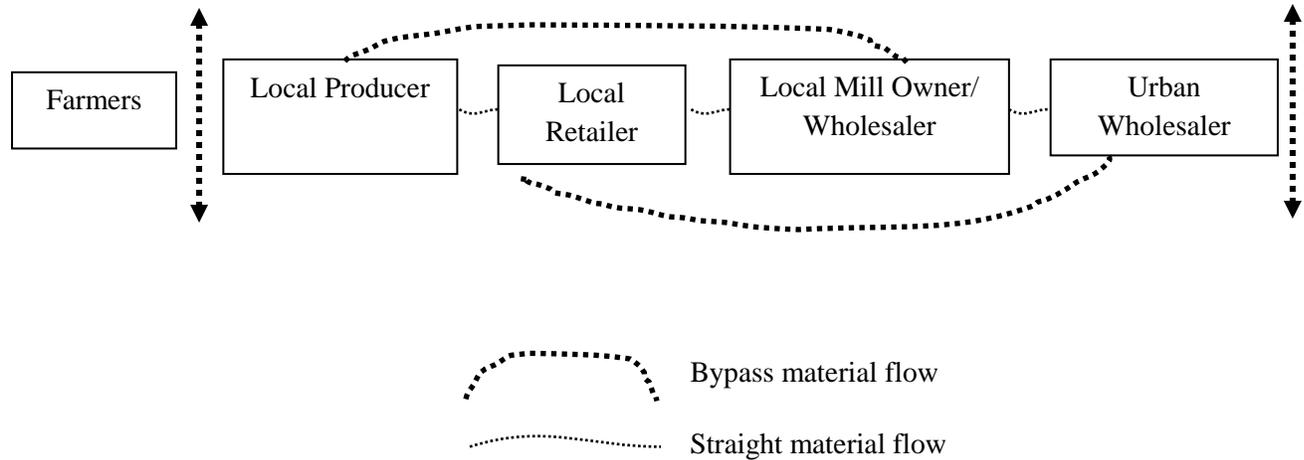
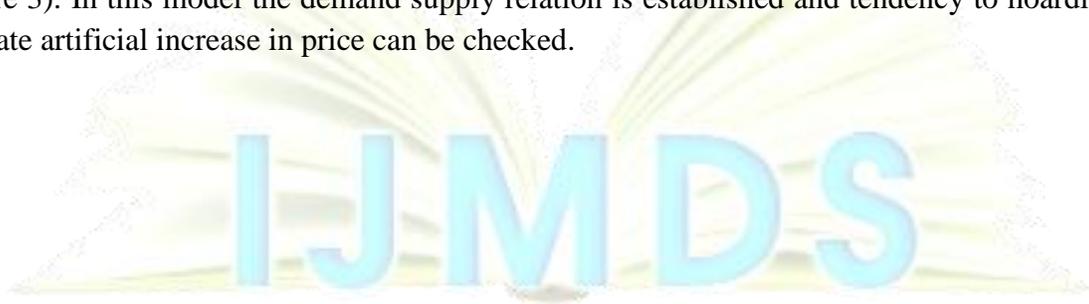


Figure 2: Present Supply Chain model

Suggested Collaborative Supply Chain

Material flow is linked through a specific path. Small farmers not only take part in producing rice but act as active members of the supply chain. Farmers sell their product to the local producer. Then the flow of materials is linked through different members of the supply chain (Figure 3). In this model the demand supply relation is established and tendency to hoarding, or to create artificial increase in price can be checked.



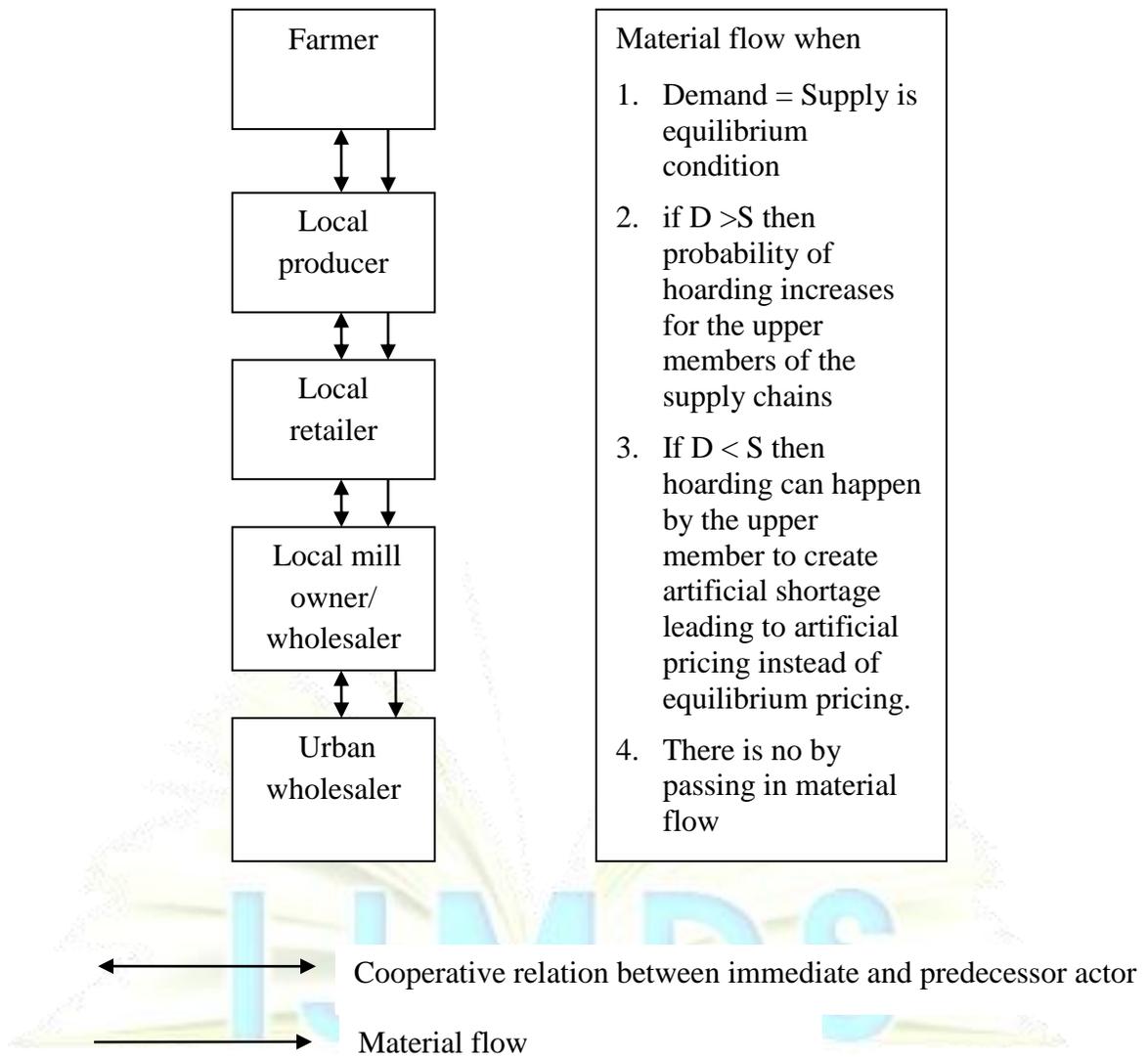


Figure: 3 Suggested collaborative model- No bypass of material flow

Conclusion

This study reveals that there exists no collaboration among the actors of supply chain in Bangladesh and ‘participation’ of the small farmers in the process is nil. Here is proposed a concurrent two-level collaboration; one within the small farmers and the other between the small farmers and producers. Since the crop production has manifested seasonality trend with perishable nature where producers lack hoarding, under this circumstance, they are generally compelled to sell in a market condition characterized by supply outpacing demand. This study also shows around Tk. 3000 taka incremental deficit per *acre* of cultivation stemming from lack of value addition. Two- level collaboration in the SCM would buy time in favor of the small farmers as well as for the producers to watch the market condition and get a better bargain for their produce.

References

- Anderson, D.L. and Lee, H. (1999), "*Synchronized supply chains: the new frontier*", Achieving Supply Chain Excellence through Technology, Vol. 1, pp. 12-21.
- Andraski, J.C. (1999), "*Supply Chain Collaboration*", (accessed 01/09/2000)
- Barratt, M. and Oliveira, A. (2001), "*Exploring the experiences of collaborative planning initiatives*", International Journal of Physical Distribution & Logistics Management, Vol. 31 No. 4, pp. 266-89.
- Becker, J.F.F., Verduijn, T.M. and Kumar, K. (2004), "*Supply chain collaboration across strategic, tactical and operational planning*", available at: www.klict.org/docs/PPhr175.pdf
- Bowersox, D.J. (1990), "*The strategic benefits of logistics alliances*", Harvard Business Review, Vol. 68 No. 4, pp. 36-43.
- Bradach, J. and Eccles, R. (1989), "*Price, authority and trust: from idea types to plural forms*", Annual Review of Sociology, Vol. 15, pp. 97-118.
- Chopra, S. and Meindl, P. (2001), Supply Chain Management: Strategy, Planning and Operation, Prentice Hall Editions, Upper Saddle River, NJ.
- Christopher, M. (1998), Logistics and Supply Chain Management, 2nd ed., Pearson Education Publishing, Harlow.
- Corbett, C.J., Blackburn, J.D. and van Wassenhove, L.N. (1999), "*Partnerships to improve supply chains*", Sloan Management Review, Vol. 40 No. 4, pp. 71-82.
- Cox, A. (1997), Business Success, Earlsgate Press, Stratford upon- Avon.
- Cox, A. (1999), "*Power, value and supply chain management*", Supply Chain Management: An International Journal, Vol. 4 No. 4, pp. 167-75.
- Cox, A. and Chicksand, D. (2005d), "*The limits of lean management thinking: multiple retailers and food and farming supply chains*", European Management Journal, Vol. 23 No. 6, pp. 648-62.
- Cox, A., Lonsdale, C. and Watson, G. (2003), "*The role of incentives in buyer-supplier relationships: industrial cases from a UK study*", Proceedings of the 19th Annual IMP Conference, Lugano, 4-6 September.
- Dapiran, G.P. and Hogarth-Scott, S. (2003), "*Are co-operation and trust being confused with power? An analysis of food retailing in Australia and the UK*", International Journal of Retail & Distribution Management, Vol. 31 No. 5, pp. 256-67.
- Dyer, J.H. and Singh, H. (1998), "*The relational view: co-operative strategy and sources of inter-organisational competitive advantage*", Academy of Management Review, Vol. 23, No. 4, pp. 660-79.
- Fawcett, S.E. and Magnan, G.M. (2002), "*The rhetoric and reality of supply chain integration*", International Journal of Physical Distribution & Logistics Management, Vol. 32 No. 5, pp. 339-61.
- Gattorna, J.L. and Walters, D.W. (1996), Managing the Supply Chain, Macmillan, Basingstoke.
- Gunasekaran, A., Patel, C. and Tirtiroglou, E. (2001), "*Performance measure and metrics in a supply chain environment*", International Journal of Operations & Production Management, Vol. 21 Nos 1/2, pp. 71-87.
- Handfield, R.B. and Bechtel, C. (2004), "*Trust, power, dependence, and economics: can SCM research borrow paradigms?*" International Journal of Integrated Supply Management, Vol. 1 No. 1, pp. 3-32.
- Hines, P. (1994), Creating World Class Suppliers, Pitman, London.

- Huxham, C. (1996), *Creating Collaborative Advantage*, Sage Publications, London.
- J.H. and Wubben, E.F.M. (Eds), *Proceedings of the 6th International Conference on Chain and Network Management in Agribusiness and the Food Industry 27-28 May, Ede.*
- La Londe, B. (2002), “*Who can you trust these days?*” *Supply Chain Management Review*, May/June, p. 11.
- Lamming, R. (1993), *Beyond Partnership*, Prentice Hall, New York, NY. Lewis, D.J. (1990), *Partnership for Profit: Structuring and Managing Strategic Alliances*, The Free Press, NY.
- Macneil, I.R. (1981), “*Economic Analysis of contractual relations: its shortfalls and the need for a rich classificatory apparatus*”, *Northwestern University Law Review*, Vol. 75 No. 1, pp. 1018-63.
- Matopoulos A., Vlachopoulou M. and Manthou V. and Manos, (2007) “*A conceptual framework for supply chain collaboration: empirical evidence from the agri-food industry*”, *Supply Chain Management: An International Journal* 12/3 pp 177–186
- Matopoulos A., Vlachopoulou, M., Folinas, D. and Manthou, V. (2004), “*Information architecture framework for agri-food networks*”, in Bremmers, H., Omta, S.W.F., Trienekens,
- McCarthy, T.M. and Golicic, S.L. (2002), “*Implementing collaborative forecasting to improve supply chain performance*”, *International Journal of Physical Distribution & Logistic Management*, Vol. 32 No. 6, pp. 431-54.
- McLaren, T., Head, M. and Yuan, Y. (2002), “*Supply chain collaboration alternatives: understanding the expected cost and benefits*”, *Internet Research: Electronic Networking Applications and Policy*, Vol. 12 No. 4, pp. 348-64.
- Mentzer, J.T., Fonghin, J.H. and Golicic, S.L. (2000), “*Supply chain collaboration: enablers, impediments and benefits*”, *Supply Chain Management Review*, Vol. 4, September-October, pp. 52-80.
- Muchstadt, J.A., Murray, D.H., Rappold, J.A. and Collins, D.E. (2001), “*Guidelines for collaborative supply chain system design and operation*”, *Information System Frontiers*, Vol. 3-4, pp. 427-53.
- Power, D. (2005), “*Supply chain management integration and implementation: a literature review*”, *Supply Chain Management: An International Journal*, Vol. 10 No. 4, pp. 252-63.
- Sahay, B.S. (2003), “*Supply chain collaboration: the key to value creation*”, *Work Study*, Vol. 52 No. 2, pp. 76-83.
- Stank, T.P., Crum, M. and Arango, M. (1999), “*Benefits of inter-firm co-ordination in food industry supply chains*”, *Journal of Business Logistics*, Vol. 20 No. 2, pp. 21-41.