

ADOPTION OF SOLID WASTE MANAGEMENT PRACTICES BY AGRIFOOD PROCESSING FIRMS IN SRI LANKA: EXPLORING THE DYNAMIC ROLE OF MARKET-BASED INCENTIVES USING PANEL DATA

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The environmental economics literature suggests that the reliance of environmental policy on market-based incentives (MBI) has led firms to shift from regulation-driven management approaches to proactive strategies involving the voluntary adoption of environmental management systems. Further, it has been observed in many contexts that provision of information about environmental performance of firms to the public generates, market-based incentives for firms to improve their environmental performance.

In the light of this, Jayasinghe-Mudalige and Udugama (2010), in the context of firms operated in the agri-food processing sector in Sri Lanka, investigated the potential impacts of market-based incentives for firms to adopt solid waste management practices (SWMP) recommended by the Ministry of Environment of Sri Lanka. It concluded that firms, in general, do not take into account importance of such incentives to a greater magnitude, but they realize the potential role of certain incentives over the others to act on this respect. The purpose of this study was to explore how those paradigms and perceptions of managers on these MBIs changed overtime. It examines, using panel data, the role of key individual MBIs, namely: (1) Reputation; (2) Technical Efficiency; (3) Sales & Revenue, and (4) Commercial Pressure, to adopt those SWMP by agri-food processing firms.

The data were gathered from a cross section of firms (n=90) operated in the Western and North-Western Provinces of Sri Lanka by means of a personal interview with the owner/top executive of firm with the aid of a structured questionnaire during March to August, 2012 (*Stage 2*) were matched with those collected on same variables from the same set of firms in 2009/2010 (*Stage 1*). A number of quantitative techniques were employed to analyze data, including: estimation of Mean Ranks; derivation of an Aggregate Index (MBII), the Kruskal-Wallis and Paired *t* tests.

The results showed that the level of adoption of SWMPs had improved overtime, *i.e.* (Mean, Standard Deviation) (1.2, 1.60) in Stage I to (1.8, 1.33) in Stage II, suggesting the sector, as a whole, becoming “greener” (Figure 1). The estimates from Mean Ranking highlighted that firms, moving from Stage I to II, in general, considered that Reputation and Technical Efficiency as the 1st and 2nd most important incentives. However, overtime, Sales & Revenue have emerged as the 3rd most important MBI by pushing Commercial Pressure to the 4th place (Figure 2). The outcome of Kruskal-Wallis test highlighted that there is a significant difference between the strength of each of these incentives on the level of adoption of SWMPs. It was also observed that firms' perception on these incentives, reflected by the value of MBI has significantly improved over time ($p = 0.05$). The improved perception in MBIs is evidently reflected by a considerable increase to the total number of practices adopted by a firm, detected from Stage I to Stage II (see, Figure 1a and 1b).

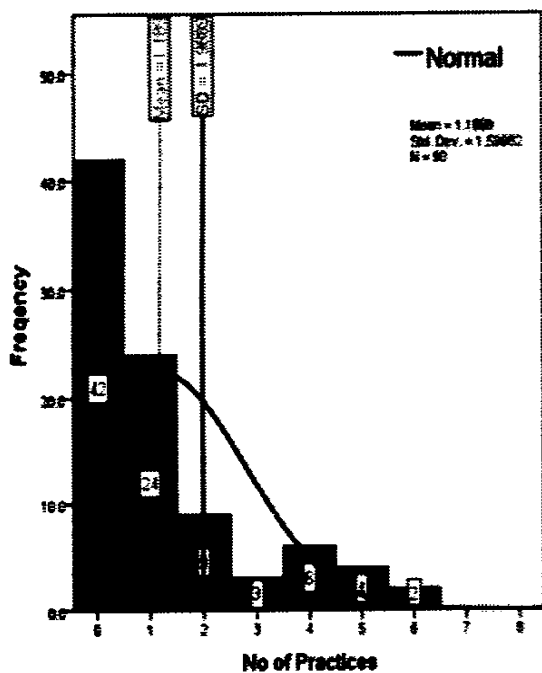


Figure 1a: No. of SWMPs adopted in Stage I

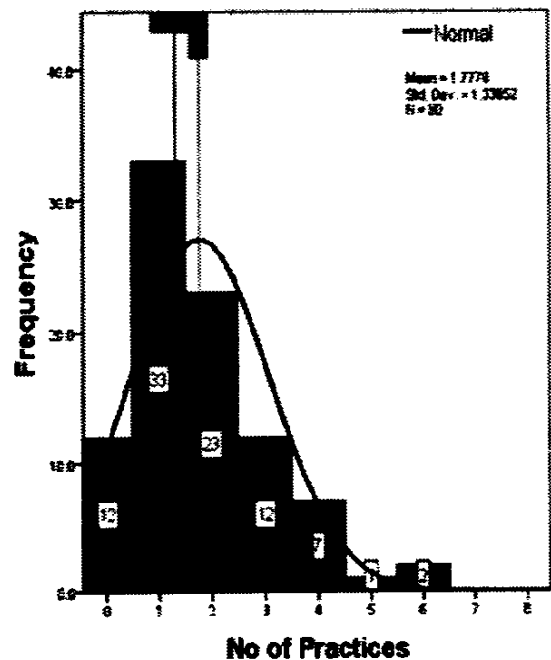


Figure 1b: No. of SWMPs adopted in Stage II

Table 1 - Changes in the mean rank of MBIs

MBI	Mean Rank (Relative Position)		% of Change
	Stage I	Stage II	
Reputation	1.17 (1)	1.70 (1)	- 45.3
Technical Efficiency	2.48 (2)	3.04 (2)	- 22.6
Commercial Pressure	3.23 (3)	3.77 (4)	- 16.7
Sales and Revenue	4.62 (4)	3.26 (3)	29.4

The results implied that, as the sector becomes greener, firms focus, while maintaining their reputation and efficiency, more on sales and revenue as they now face relatively low pressure from the customers and neighborhood, *etc.* towards adopting better greening practices. If these incentives can be translated into initiatives motivated by environmental responsibility, we may suggest that a futuristic firm will additionally be motivated by anticipated competitive advantage, which would easily be propelled by their voluntary adoption over time.

Keywords: *Agri-food processing sector, Economic incentives, Environmental management, Panel data, Solid waste management*

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- Jayasinghe-Mudalige, U. K. and J. M. M. Udugama (2011), Motives for Firms to Adopt Solid Waste Management Controls: The Case of Food Processing Sector in Sri Lanka, SANDEE Working Paper 6011 (ISSN 1893-1891), South Asian Network for Development and Environmental Economics, PO Box 8975, EPC 1056, Kathmandu, Nepal.