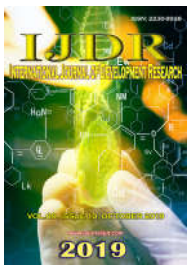
ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 09, Issue, 10, pp. 30962-30967, October, 2019



RESEARCH ARTICLE OPEN ACCESS

THE BENEFITS OF REVERSE LOGISTICS IN THE HEALTH AREA

[1]Cibele Del Hoyo Pacheco, [2]Maykon Anderson Pires de Novais and *[3]Márcia Mello Costa De Liberal

[1]Graduate Program in Health Management and Informatics, Federal University of São Paulo, Brazil
[2]Department of Health Management and Informatics, Discipline of Economics and Management in Health Federal University of São Paulo (Unifesp), Brasil
[3]Department of Medicine, Discipline of Economics and Management in Health, Federal University of São Paulo (Unifesp), Brasil

ARTICLE INFO

Article History:
Received 17th July, 2019
Received in revised form
11th August, 2019
Accepted 22nd September, 2019
Published online 30th October, 2019

Key Words:
Reverse Logistics,
Health, Health Services.

ABSTRACT

This work aimed to connect the basic strategies of reverse logistics applied in healthcare in the most varied processes. For this, it was necessary to elucidate the general assumptions about business logistics and outline a brief history of the historical evolution of services for ensuring the wholesomeness of the Brazilian population since the beginnings of colonization until the creation of the SUS. As a relatively new concept, it added various suggestions of activities to show how this joint effort can contribute to the improvement of services in this sector, for the safety of health professionals and the general public, in addition, to collaborate for the preservation of the ecosystem by means of recycling and reusing products and raw materials in hospital environments.

Citation: Cibele Del Hoyo Pacheco, Maykon Anderson Pires de Novais and Márcia Mello Costa De Liberal. 2019. "The benefits of reverse logistics in the health area", *International Journal of Development Research*, 09, (10), 30962-30967.

INTRODUCTION

The content of this article focuses on the discussion of the logistics theme focused on health services. Therefore, it was necessary to observe the main aspects of the organization of the Brazilian Health System. In this sense, the idea of logistics consists of grouping together activities related to the flow of products and services and then managing them collectively, as a kind of natural evolution of the administrative practice. However, the business administration process was not always concerned with coordinating logistics activities. The area considered important once companies began to realize substantial cost gains by carefully coordinating these activities and becoming vital. This statement is justified by the fact that both resources and users have spread over a wide geographical area, and it is necessary to propose an activity capable of reducing the space and the distance between production and demand, so that the whole population can have these services whenever and wherever they want and in the desired physical condition too.

Corresponding author: Márcia Mello Costa De Liberal
Department of Medicine, Discipline of Economics and Management in Health, Federal Universityof São Paulo (Unifesp), Brasil

Because the logistics process has considered vital to the success of an organization, under modern management assumptions, it consists of a new business vision that can drive business performance by reducing time lead between order, production, demand, and delivery of goods or services to customers at the desired time, place and price. Along these lines, logistics can be understood as a dynamic activity that includes the planning, implementation, and control of the efficient and effective flow of goods, services and information from the place of origin to the place of consumption, with a view to its purpose to meet customer needs. The importance of logistics in managing flows of services and goods has become so critical that today it encompasses the process of strategically managing the procurement, movement, storage and distribution of materials and finished products. In the current context, in which society's vision of consumption has been undergoing profound changes, only logistics is no longer enough to win over and retain the public-consumer. Mainly due to the increasing ecological concern of much of the population and the new standards of competitiveness of customer services, it is necessary to create several returns flows, that is, reverse logistics. Thus, a detailed analysis of the

importance of this process and its interface with the production and distribution of material goods and services rendered is necessary, as well as the return of these goods to the production cycle as a basis for the suggestion of new sustainable practices with the specific focus here on health.

MATERIALS AND METHODS

The methodology used for the development of this academic work was a bibliographical analysis of health reverse logistics development in Brazil from an updated historical perspective because this subject still needs more attention in academic terms in the health field. Firstly, a literature review was performed, searching for information in relevant articles that deal with the topic of interest as a strong theoretical basis. This narrative review did not use explicit and systematic criteria for searching and critically analyzing the literature because it is a new subject in health care. In this sense, only the already published analytical reflections on the subject have highlighted to compose the general scenario of the state of the art in which the object of study is found, as well as the selection of studies and interpretation of the subjectivity of the subject by the authors. Thus, it was possible to reach updated discussions that contribute to a deeper reflection, showing the advantages and difficulties of implementing this form of logistics in the health field.

RESULTS

For many years, the interest of organizations has been related to enterprise logistics and direct product flow management, making reverse flows no longer given due attention because they represent only a fraction of the volume of products in these distribution channels. Reverse logistics was considered by many managers to be just a packaging recycling process that, due to its deficiency or even the lack of reverse planning, became a major cost generator. However, in the last decades, it has been possible to observe an indisputable increase in the quantity and variety of products launched or improved in the market, as well as a clear reduction of the life cycle and marketing of these products, all to meet the needs of individuals and the economic system itself. As a result of this process, Leite (2009, p. 14) states that "there are larger quantities of products, still unused or already consumed, that return in some way to the production of the business cycle". Return of products becomes a new concern for companies in all sectors, becoming important and indispensable to reverse logistics activities. One of the earliest references to the concept of reverse logistics dates back to the early 1970s. The authors of the University of Colorado, Zikmund & Stanton (1971) used the term reverse distribution to referring to the similarity of distribution concepts applied in the opposite direction, to meet the needs of collecting solid materials from after-sales and after-consumption for reuse by the producer. It was during this same period that Ginter & Starling (1978) used the term reverse distribution channels, which focused on the issue of recycling and its economic and ecological advantages with emphasis on the importance of reverse distribution channels as a key factor in the economic viability of the system materials recovery process (FELIZARDO; HATAKEYAMA, 2005).

Already, in the 1980s, reverse logistics was defined as the movement of goods from consumer to producer through a return distribution channel, or collection channel (ROGERS; TIBBEN-LEMBKE, 1998 apud LOPES, 2009), limiting - thus the movement that makes products and information move in the opposite direction to traditional logistics activities. In this context, Gonçalves-Dias & Teodosio (2006) found that the motivations for the use of reverse logistics related, in particular, to waste management and the recycling process. Initially defined as an area of business logistics that involved operational aspects of product returns, reverse logistics has recently been understanding more broadly and strategically as an area of concern related to equating product return flows (LEITE, 2009). The visibility achieved by this area has stimulated the development of a larger amount of studies, as well as the evolution of its definition. Business logistics plans implements and controls the flow of goods, services and information from the place of origin to the place of consumption. Reverse logistics goes the other way, that is, it covers a process of planning, of implementation and of controlling of raw materials, inventory in the process finished goods and information from the point of consumption to the place of origin to recapture value.

This makes reverse logistics considered a new area of study that encompasses several other fields of knowledge, going beyond the purely operational view, influencing the business strategy to serve the various stakeholders of the organization (LEITE, 2009). Stock (1998, apud Leite, 2009, p. 16) addresses the issue from a business logistics perspective, because for him, reverse logistics "refers to the role of logistics in product return, source reduction, recycling, material replacement, material reuse, waste disposal, refurbishment, repair and remanufacturing [...] ". From the perspective of Tadeu *et al*. (2011), the concept of reverse logistics encompasses the traditional concept of logistics, aggregating a set of operations and related actions, which include the reduction of the amount of virgin raw materials used and the correct final destination of products, materials and packaging with consecutive reuse, recycling or production of energy. According to Freires &Guedes (2006), reverse logistics is concentrated inflows where there is a certain value to be recovered from products and materials already used, making it possible for them to enter a new supply chain. Several authors corroborate this concept, emphasizing the importance of recovering the value of goods, products or residues, or of giving the correct destination to the inputs. In this sense, Rogers and Tibben-Lembke (1998, p. 17) define reverse logistics as being

> [...] the process of planning, implementing and controlling the efficient and low-costflow of raw materials, work in process, finished product and related information from the point of consumption to the point of origin for recovery of value or proper disposal for waste collection and treatment.

Cometti (2009, p.41) agrees with the idea of Rogers and Tibben-Lembke (1998, p.72) in analyzing that the purpose of the reverse logistics process is to "recover value or properly dispose of materials". It is noteworthy that, although there is no universal definition for the concept of reverse logistics, the concept presented by the Reverse Logistics Executive Council (2011) can be considered adequate to the needs of contemporary society: Reverse Logistics is the process of planning, implementing and controlling the efficiency and

cost-effectiveness of the flow of raw materials, work in process, finished goods, and correlated information from point of consumption to point origin to recapture value or for a disposition appropriate. According to Leite (2009, p. 21), "society in all parts of the globe has been increasingly concerned with the various aspects of ecological balance". This change in social behavior, in association with the growth of legal pressures, is directly influencing the practices of companies and governments that are now acting actively through the use of different strategies to reduce the effects of environmental and environmental impacts to protect the interests of society. For Cometti (2009), in the 1990s amid the context of increasing concern and legal pressures on environmental issues and the pursuit of companies and institutions for more economical production processes, the concept of reverse logistics went through a real revolution in its practice, incorporating the terms after-sales and post-consumer. It includes the environmental issue and the various types of value-added that permeate the context of this discussion globally.

Rising consumer green concerns, new environmental laws, new standards of competitiveness and concerns about corporate image have made reverse logistics increasingly important for organizations offering products and services. This process also contributes to solving the problem of the quantity and characteristics of waste materials in the environment, as well as providing opportunities for recovery and value addition, as well as potential cost savings. For Ferreira Filho *et al*. (2011), the incorporation of reverse logistics principles by companies is influenced by several factors, among them the regulations created by regulatory agencies, the incessant pursuit of economic efficiency and the enhancement of the corporate image. These factors, according to the author, reflect the social and environmental responsibility that makes companies try to adapt to legal requirements. According to the international working group for the study of reverse logistics, the main reasons that lead companies to use reverse logistics are the environmental legislation that forces companies to return their products and take care of the necessary treatment. It also includes the economic benefits of using products that return to the production process, rather than the high costs of proper waste disposal and increasing environmental awareness on the part of the population. As a way of reacting to the impacts that products have been having on the environment, Leite (2009, p. 23) believes that "societies have developed a series of laws and new concepts of corporate responsibility to adapt economic growth to the variables environmental issues."

In the opinion of Cometti (2009), the final disposal of discarded products has controlled by the authorities and by current legislation already contemplates various aspects related to the useful life of products, such as the manufacturing process and the use of virgin raw materials. In the case of Brazil, the Federal Constitution deals comprehensively with environmental issues. However, it is incumbent upon the federal, state and municipal levels to commit to drafting and promulgating specific rules and laws capable of protecting the environment. In this sense, several products are already under specific national legislation regarding their disposal. Among the most current legislation, we highlight the National Council of the Environment (Conama), regarding the packaging of pesticides, tires, batteries, and batteries. As a historical landmark of Brazilian environmental management, there is Law n. 12,305, enacted on August 2010, which establishes the National Solid Waste Policy and presents a modern vision regarding the fight against urban "waste", one of the biggest challenges in the world. The law in question brings as a principle the shared responsibility between companies, government, and population. It contemplates several factors related to post-consumer reverse logistics, such as classification for different types of solid waste, the institution of the household selective collection in municipalities with more 150 thousand inhabitants and the incentives with differentiated taxation to the products in different phases of the reverse channels. For Rogers & Tibben-Lembke (1998), the economic importance of reverse logistics is associated with the opportunity to recover part of the value of returned, unsold, surpluses, wasted and damaged materials. Concerning environmental awareness, society is increasingly concerned with aspects of ecological balance. According to Leite (2009), this concern is justified by the increased speed of disposal of products in general that, because they do not find well-structured reverse distribution channels, cause serious imbalances between the quantities discarded and reused. In this line of conduct, laws, and regulations always seek to require organizations to be ethical in their relationships with society and the environment.

DISCUSSION

The Logistic Function related to Health was disassociated from the Viceroyalty commitment during the colonization period, leaving the physical well-being of each citizen or family. However, this lack of state commitment resulted in an anarchic state for the relationship between the Brazilian population and the government, a fact that went against the interests of the leaders, who decided to develop public policies capable of creating a bond of dependence on the people to the state. These measures to maintain state authority were only possible with the adoption, initially, of Hygienic Medicine and thanks to the power of the family. At that time, medical care had a caricatured view of welfare associated with religious practice. In this context, both the traditional family and the church gave no space for the nationalized power to dominate social policy. The arrival of the Royal Family reshaped this scenario, bringing the state to independence and supremacy in medical treatment in diffuse villages as health promotion became a goal to be achieved. Due to the various tropical epidemics and the outbreaks of infections caused by air and water contagion, preventing these diseases has always been one of the great concerns of Colony Brazil, precisely because there are not enough resources to combat and decimate these diseases. During the Imperial Administration period, due to the increased circulation of diplomats, foreign merchants and noble families from the countryside to the metropolis, investment of financial resources allowed the drainage of marshes. They paved streets, including the regulation of food trade and the construction of basic sanitation as measures aimed at the sanitation of the population that gave rise to Preventive Medicine. It was entirely the responsibility of the state and aimed primarily at elite families since it was not in the state's interest to change the family pattern of slaves, who should continue to obey their owners and subject to the punishments established at that time. It is worth noting that

slaves, along with the underprivileged of all kinds, will be inserted into the medical scene as references in the fight against the family rebellion. For this reason, in addition to them, beggars, crazy people, vagabonds and Gypsies have become a model of example without been followed by borderline cases of hygienic misconduct. For this marginalized group, other medical policies have created. It was upon the elites that medicine focused its family policy, criticizing the colonial family in their crimes against health.

Given this situation, health has finally considered an assignment of the State that, from then on, began to exercise political power over society, standing out as responsible for Health Policy and the use of this potential in the planning of a Logistic Function applied to health at the national level. Nowadays it is part of the State's duty to be committed to the Government policy and the population health using strategies designed to serve people about health care. This goes from the municipal sphere to the Federal Government. Following this line of evolution, the Ministry of Health established itself as the manager of the Unified Health System (SUS), created in 1988, based on the decentralization and uniqueness command of the Union Area Health Services to all Brazilian municipalities. Thus, the SUS integrates the federal, state and municipal health networks, without the inclusion of health subsystems of the Armed Forces. Also, if the availability of SUS is not sufficient for a given area, it is still possible to resort to the private medical-hospital initiative, established through contracts or agreements. Currently, the availability of resources in the SUS characterizes the potentiality of the Health Logistics Function at the national level and it has used for support in case of mobilization throughout the Brazilian territory. Already, the capacity of National Health has gauged by the quality of hospital facilities, clinics, clinics and outpatient clinics, including the beds offered to Public and Private Health Networks. It is noteworthy that if hygiene in cities was in the past the major factor responsible for the imposition of state policy, now the National Potential of the Health System has established the forms of care according to a set of rules that must be applied according to the needs of each specific citizen or region. Thus, the Brazilian state power uses the means of SUS to take care of the life of the population, aiming to cover the entire surface ranging from organic to biological, from citizen to population, thanks to the establishment of the double mechanism that disciplines and at the same time, regulates any form of medical care or relief. In this context, health insurance or old-age insurance systems, as well as hygiene standards that ensure the longevity of citizens through vaccination campaigns, family hygiene rules, medical care for children, especially in schools, will establish the so-called biopower between government and society. Therefore, the National Health Logistics proves to be a strong support structure in terms of guaranteeing the welfare of the entire nation. Given this context, reverse logistics in recent years has been a strategic point of value addition, being able to generate profits and ensure sustainability, meeting current environmental legislation and economic benefits. In the hospital environment, there is the reverse logistics applied to medicines, which, although inefficient, is already beginning to show signs of its implementation, and should use the same path that the drug makes from the final consumer to the manufacturer, due to its potential danger to the environment and human health. The main concern of medicines has related to their volume, self-medication and incorrect reuse without prescription. In case of improper disposal, there is a possibility that this material may be reused by others without a care. According to discussions so far, business logistics has emerged as a kind of tool to assist companies in the administration and distribution of goods and services, ensuring greater profitability and satisfaction. In this context, the concept of reverse logistics emerges, which is fraught with ecological concerns and, following the new environmental legislation, proposes that companies seek strategies for the return of after-sales and after-consumption goods, adding economic value, respecting environmental legislation and promoting environmental awareness. In the medical-hospital setting, solid waste management, as well as the application of reverse logistics, ensures safety for all individuals involved, as well as reducing social and environmental impacts and generating financial resources for institutions. Therefore, it is necessary to invest in the diffusion and training of all individuals who are part of this process, so that the generating sectors can separate the waste and include it in the correct production cycle.

In the case of managers, they must ensure that this waste is properly packaged and stored, according to the rules established by the National Health Surveillance Agency (ANVISA). Besides, the companies involved must be licensed and certified by the relevant environmental agencies. As they are major generators of the use of drugs such as antibiotics/chemotherapy, hospitals should adopt preventive measures for the management, handling, internal transport, separation and disposal of waste through drug segregation and selective collection.It also may be delivered the product discard material at special collection points so that there is no more leftover available to consumers. Similarly, fractional distribution of medicines (dose unitization) is the creation of possible collection channels, such as the withdrawal of expired or unusable medicines by distributors when new batches have delivered to public and private health institutions. Thus, the process is environmentally responsible, since these wastes can no longer pollute the environment due to their proper collection and disposal. In the health care waste management process, this can be an opportunity for improvement, because when the correct waste classification has done, a portion can be recycled and new financial resources generated. In practice, recycling office materials such as paper also often generate a financial gain for the hospital institution.

Reverse Logistics can be applied on a day-to-day basis, a good example of how this process occurs is oxygen torpedo. The hospital buys this full device and then returns the same empty container to the provider so that the cycle can be restarted, making the provider responsible for the entire supply cycle as well as the return cycle. In this case, the management can be performed by delivering a torpedo to obtain a new one that is not only buying a new torpedo but also returning it emptied. The advantages are proper disposal of the product, reuse and proper cleaning by the company, and the supplier himself performs reverse logistics, avoiding the constant disposal of material and may reuse it. When reuse of a product is not possible, proper disposal has to be made to preserve the environment of these polluting agents. Applying the concept of reverse logistics in a hospital medical context involves planning and the need to create a Reverse Logistics Plan, involving the listing and knowledge of all existing products in

the organization, according to their life cycle by classifying them into disposable goods, durable goods, and semi-durable goods. Regarding the return form, it is necessary to check whether there are reverse reuse channels, reverse cutting channels, reverse recycling and incineration channels or the landfill, including taxonomy according to current environmental and sanitary legislation in both classification and disposal destination of products. After elaborating this plan covering all these issues, the next step is the qualification of suppliers, providing for the return strategy that includes the management, storage, collection of items and destination by the institution, as well as commercial and economic aspects involved in this process. This worth remembering that logistics is important in the medical-hospital area because it provides substantial cost savings through the management of activities that include pharmacy, warehouse, nutrition, and predictive/clinical engineering and other sectors. Logistics can be integrated in a perfect way between all these areas. However, direct flow logistics alone is not sufficient to meet the needs of the institution/consumers, and reverse logistics that enable the creation of return flows are required too. Tadeu *et al*. (2011) understand that reverse logistics emerges as a strategic value-adding process, capable of generating profit centers and ensuring sustainability. This process provides a key competitive differentiation as it involves product return, added economic value, ecological aspects, corporate image and compliance with current legislation. Reverse flow can be accomplished through reuse, cutting and recycling, bringing goods back to the production cycle or to their final destination, which is landfill or incineration. There are hospitals where the supply logistics is "controlled" by the technical management, having in the Standardization Committee the sectors already mentioned, the operating room, the ICU, Nutrition and the CCIH. The materials and medicines have directed to each sector according to need or request, to maintain and replenish stocks.

CONCLUSION

Accordingly, business logistics emerges as an alternative to assist companies in the administration and distribution of goods and services, ensuring greater profitability and satisfaction. In this context, the concept of reverse logistics emerges, which is fraught with ecological concerns and following the new environmental laws, proposing that companies seek strategies for the return of after-sales and after-consumption goods, adding economic value, respecting the legislation, promoting environmental awareness. In the medical-hospital context, solid waste management, as well as the application of reverse logistics, ensures safety for all individuals involved and reduces social and environmental impacts, as well as generating financial resources for institutions. Therefore, it is necessary to invest in the diffusion and training of all involved in the process, so that the generating sectors can separate the waste and include it in the correct production cycle. In this regard, managers need to ensure that these wastes are properly packaged and stored, following the rules established by ANVISA and, besides, the companies involved have to be licensed and certified by the competent environmental agencies. In a large hospital that performs reverse logistics and sees it as an opportunity to generate resources and to comply with current regulations too. The hospital sector has its peculiarities, as it generates several types of waste. It has to be reinserted in the production chain and others that need proper final disposal, given the imminent risk to the environment, as it is contaminant, biological and chemical waste. The waste is separated at the place of generation and destined for proper recycling or disposal. This hospital seeks to generate resources, protect the environment, complying with the law and medical care about its image with the community, as it demonstrates a concern for the environment and sustainability.

The purpose of this article was to analyze the importance of reverse logistics management, with emphasis on its application in the health area. The analysis performed serves as a reference for the adoption and future practices of reverse logistics. Therefore, the main contributions of this study are to broaden the understanding of the reverse logistics process and to demonstrate its importance to increase the quality of services provided in hospitals. Also, there is the intention to contribute to the increase of scientific literature in this area, which is still very scarce. The application of reverse logistics in a medical-hospital environment is of fundamental importance due to the large amount of post-consumer waste that is most often infected. Proper waste management mainly benefits the environment when disposing of it responsibly. When it comes to disposal by incineration, we have to think about air pollution, the greenhouse effect and, in the case of landfills, it is also necessary to reflect on this disposal so that there is no contamination of the soil and groundwater. Another important aspect concerns the preparation of health workers in reverse logistics activities. As soon as the product is used, it should be disposed of correctly, as the sharps must be disposed of in appropriate cardboard boxes. With an organized service, you make better use of time and minimize the possible health risks of professionals in general.

Thus, it is possible to obtain great advantages with this tool when it comes to sustainability. This waste goes back into the production chain reducing the consumption of raw materials in a hospital, which must buy only the amount that will be used actually. As the reverse logistics starts after the consumption of the product, having as its final destination or point of origin, that is, where it began its manufacture, managing the cost reduction, materials recycling. Therefore, this strategy requires managers and health professionals to conduct themselves with serious commitment, dedication, and responsibility to obtain effective results. Finally, all of the suggested logistics suggestions can be apply in joint actions or separately, depending on each professional context, to be incorporated into the daily routine of hospital environments at the national level for quality of care and environmental sustainability.

REFERENCES

Cometti, JLS. *Logística reversa das embalagens de agrotóxicos no Brasil*: um caminho sustentável?, 2009.

Felizardo, JM., Hatakeyama, KA. Logística reversa nas operações industriais no setor de material plástico:um estudo de caso na cidade de Curitiba. *ENANPAD*, 29. Brasília, 2005. Anais. Brasília, 2005, p. 1-17.

Ferreira Filho, HR. *et al*. Logística reversa*:* um estudo de caso em uma empresa pública de briquetes no município de Tailândia-Pará. *ENANPAD*, 35. 2011, Rio de Janeiro, p. 1-17.

Freires, FGM., Guedes, APS. A gestão do sistema logístico inverso para pneus-resíduo e sua relação com a eficácia e eficiência. *ENEGEP*, 26, 2006, Fortaleza, p.1-8.

Ginter, PM., Starling, JM. Reverse distribution channels for recycling. *California Management Review*, v. 20, n. 3, p. 72-82, 1978.

Gonçalves-Dias, SLF., Teodósio, ASS. Estrutura da cadeia reversa: caminhos e descaminhos da embalagem PET.*Revista Produção*, v. 16, n.3, p. 429-441, Set/Dez, 2006.

Leite, PR. *Logística Reversa*: meio ambiente e competitividade. 2. ed. São Paulo: Pearson Prentice Hall, 2009.

Lopes, D. *Uma Contribuição na Estrutura dos Fluxos Logísticos Reversos das Lojas de Departamentos*. 2009. Tese de Doutorado. Master Thesis on Program in Transports Engineering.

Rogers, DS., Tibben-Lembke, RS. *Going backward: reverse logistics trends and practices*. Reno: Reverse Logistics Executive Council, University of Nevada: 1998.

Stock, JR. Reverse logistics programs. *Council of Logistics Management*, Illinois, 1998, apud: Leite, P. R. *Logística Reversa*: meio ambiente e competitividade. 2009.

Tadeu, HFB. *et al*. *Logística reversa e sustentabilidade*. São Paulo: Cengage Learning, 2011.

Zikmund, WG., Stanton, WJ. Recycling solid wastes: a channels-of-distribution problem. *Journal of marketing*, v. 35, n. 3, p. 34-39, 1971.

****