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Title

SCRAP MANAGEMENT IN APSRTC – A STUDY AND ANALYSIS

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ABSTRACT:

The economic development of any country largely depends on the transport activity. Among the various modes of transport available, the road based transport is widely accepted because of its peculiar advantages. In India, the public transport undertakings are facing heavy competition from private ownership and operating in an environment of privatization. One among the various reasons for getting losses in transport undertakings is the absence of proper scrap management policies. The present work is a study on the practices of scrap management of Andhra Pradesh State Road Transport Corporation. The effectiveness of scrap management policies is measured in terms of obsolete materials, number of vehicles scrapped, revenue on the materials scrapped, and the revenue realized on the sale of scrap materials and vehicles, the share of scrap revenue in the total non-operating revenue and in the total revenue, and percentage of scrap inventory in the total inventory. The data have been analyzed using various statistical tools. The results indicate that the scarp management practices of the corporation were good.

Keywords: Scrap, Scrap Management, Effectiveness, Privatization, Transport Undertaking,

INTRODUCTION:

Infrastructural facilities, viz., power, transport and communication network etc., are essential inputs for any country's economic development. Out of these inputs, transport facility is one of the key factors required for economic development because there is hardly any activity which is not influenced by transport service. It is a fact that socio economic activities and transportation system are closely related. Road transport system assumes a significant position in the overall development of any country. Road and road transport are the important constituents of any transport system. A well developed, cheap and efficient network of transport system leads to speedy movement of human beings, materials and resources more effectively from their places of abundance to the places of inherent demand. It creates a feeling of ourselves among the people with a spirit of progress thereby able to overcome their apathy and isolation. Since people need to travel, goods have to be moved from place to place, so transportation acts as catalyst and forms the back bone of the economic growth.

Transport has long been recognized as an engine of growth for the long term development of any country. In a predominantly economy with a vast and growing populace spread over an extensive mass of land, notwithstanding the vagaries of development in other sectors, the transport sector in India, ironically has received scant attention over the past few decades of the planning era. The road based transport is the popular mode of transport because of its peculiar advantages such as flexibility, capital requirements, capacity, infrastructure, accessibility and adoptability, in addition to route, direction, time and speed etc. Public transport plays a vital role in providing services to the rural areas. It helps in connecting the rural population living in remote areas with the main stream of socio economic activities. It is considered to be a vital infrastructure and a predominant mode of transport in moving short and medium distance passenger traffic in the country.

At the time of independence the road transport services were entirely in the hands of private operators, and the transport sector was completely fragmented and totally unorganized. There were several private operators competing among themselves and the quality of services rendered to the traveling public was also substandard. They try to snatch each other's piece of traffic share. In this cut throat competition for survival, each one gets so little with which one cannot live long. The main objective of the private operators was to make profits without any social concern. As a result, people at large were deprived of adequate transport services and there was large scale exploitation of labour in this sector.

Realizing the evils of uncoordinated and uncontrolled passenger road transport, Government of India enacted the ''Road Transport Corporations Act-1950'' enabling the states to establish corporations and to progressively nationalize the bus transportation in the country. The objectives as laid down by the RTC act are ''to provide an efficient, adequate, economic and properly coordinated transport services and to run on business principle''. Consequently with the enhancement of this act, several states have established road transport corporations for running their services. After the introduction of 1950's Road Transport Corporations Act, the process of bus transport nationalization started in the country and a well organized bus transport system was developed to serve the traveling public.

After more than 5 decades of nationalization of passenger road transport and consequent formation State Transport Undertakings (STUs), the passenger transport industry is suffering

from losses and not in a position to offer various services to travelling public. As a result dissatisfied public transport passengers are increasingly turning towards private mode of transport. One among the various reasons for mounting losses to the transport undertakings may be due to the absence of proper scrap management policies. Because, scrap management plays an important role in deciding the profitability of any service organization, an attempt has been made in the present study, to know the performance of scrap management practices of Andhra Pradesh State Transport Corporation.

SIGNLFICANCE OF THE STUDY:

The importance of scrap management lies in the fact that any significant contribution made by the materials manager in reducing the cost of scrap material goes a long way in improving the profitability of the organization. The operational expenditure increases to higher levels year after year while the margins are narrowing down and budgets are stretched. Hence, it is necessary to find the way for maximization of revenues. One of the ways for the maximization of revenue is the effective management of scrap, surplus and obsolete materials. This activity is treated as an important activity of the material management. By taking a little amount of care, it is possible to reduce such items and with timely action, a lot of saving can be achieved as carrying these materials is a costly affair. The carrying cost on these material include, inventory holding charges which are approximately 25 to 30 percent, cost of stock taking, cost of security, cost of space, cost of record keeping and loss arises as a result of non-availability of capital invested on the materials etc. Hence, these must be disposed off frequently and the disposal action should be taken as soon as they are noticed without further delay.

Approximately over Rs.10000 crores is estimated to be tied up in the country on these materials(Gopala Krishnan, 1999) and every year nearly 17 percent i.e. over Rs. 2500 crores worth of materials and components are being locked up in the form of obsolete materials alone(Varma, 2003). Recent studies have also showed that this trend is on the increase with further industrialization and inflation. With the growth rate of industries, the scrap, surplus and obsolete materials are also increased both in volume and in value. The management of these materials involves two peculiar problems. They are minimization of their volume and the other is the maintaining a sound approach for their disposal to achieve maximum value from them. The

diverse and seemingly boundless developments that are taking place in business environment create a new series of complexities associated with those items. As these are the undesirable output encompassing all types of resources, an efficient management of these items is a multidisciplinary activity. Since the material constitutes a major proportion of the total cost of a product, material wastages are of crucial importance.

One of the important objectives of the public transport undertakings is to provide efficient transport facility to the traveling public. To achieve this objective, continuous updating and monitoring of scrap management policies are essential to keep pace with change in time, to avoid any dissatisfaction of the passengers as well as lowering the losses of the corporation. To study the scrap management practices of the corporation, various measures which are directly related to working of the corporation have been considered. These measures include number of vehicles scrapped, value of materials scrapped, the revenue realized on the sale of scrap materials and vehicles, the share of scrap revenue in the total non-operating revenue and in the total revenue, and percentage of scrap inventory in the total inventory etc. The analysis used in the present study will help the authorities of transport undertakings, to concentrate and to develop more appropriate strategies on the areas where scrap management is poor, and on the basis of which a well designed set of action can be taken for better performance of the transport undertakings.

OBJECTIVES OF THE STUDY:

As the corporation was getting losses continuously in the past few years, a study has been undertaken to know whether the losses of the corporation were due to inefficient practices of the scrap management or not. As against this back ground, the following objectives have been formulated

1. To know the scrap management practices in APSRTC, in terms of obsolete materials, number of vehicles scrapped and, revenue on the materials scrapped,
2. To know the scrap management practices in APSRTC, in terms of the revenue realized on the sale of scrap materials and vehicles, the share of scrap revenue in the total non-operating revenue and in the total revenue, and percentage of scrap inventory to the total inventory.

METHODOLOGY:

SAMPLING UNIT:

The transport undertakings, varying from state to state taking one of the four forms, as Public corporations, Departmental undertakings, Municipal undertakings or Government companies. At present there are 53 State Road Transport Undertakings. Out of these transport undertakings, the Andhra Pradesh State Road Transport Corporation (APSRTC) is the first nationalized transport undertaking in the country. It is one of the biggest public sector undertakings run by the state government and also formed as the largest single bus company in the world.

PERIOD OF THE STUDY:

The data covers for a period of 12 years ranging from 1992-93 to 2003-04. A twelve years period has been selected to analyze the information more meaningfully and focus attention on the quality of services offered by the corporation. Further this 12 years period is considered suitable to study the problems, trends on the service related factors which forms a sound basis for analysis. This Period covers significant changes in management policies, programmes of the APSRTC. During this period there were many problems with APSRTC such as union strikes, fire of buses due to various political agitations, and unrest of employees due to rising of voice by public and government for privatization of APSRTC.

SOURCES OF DATA:

The study is based on secondary sources of data. The secondary data collected from various sources such as annual administration reports of the corporation, the records of the Management Information System (MIS) wing of APSRTC, scrap control and stores records of the corporation and different manuals prepared by the corporation from time to time.

DATA ANALYSIS:

The data have been collected systematically, sorted, classified, and arranged in tabular forms which are amenable for analysis. The statistical package for social sciences (SPSS16.0) has been

used. The various suitable statistical techniques like Arithmetic Mean (AM), Standard Deviation (SD), Coefficient of Correlation (CV), Linear Growth Rate (LGR), Compound Growth Rate (CGR), Coefficient of Correlation(r), and Students t- test of significance of growth rate have been applied to analyze the empirical data.

ANALYSIS AND DISCUSSION:

MANAGEMENT OF OBSOLETE MATERIALS:

An analysis about obsolete items with the corporation is done in order to study the management of these items. The table 1(Fig 1) shows the information about the obsolete items and the ratio of inventory of obsolete items to the total inventory held by the corporation during the period between 1994-95 and 2003-04.

TABLE 1

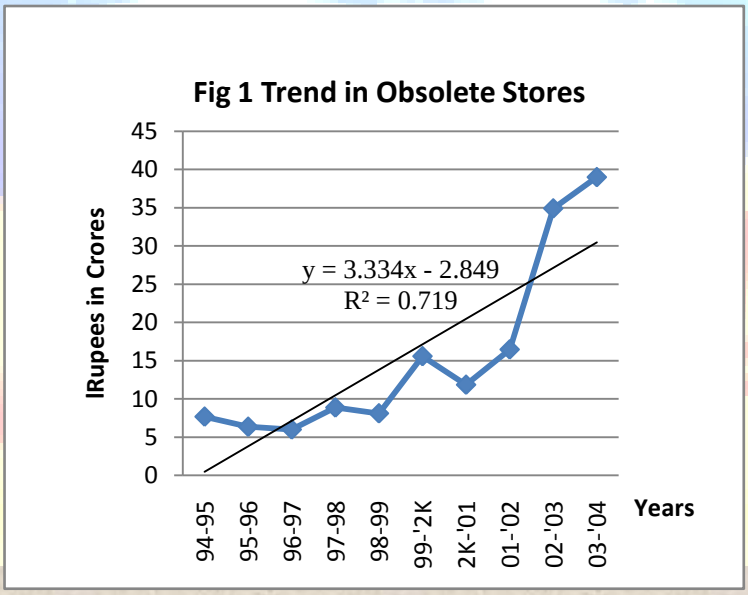
OBSOLETE INVENTORY TO TOTAL STORES INVENTORY

YEAR	OBSOLETE STORES IN CRORES OF RUPEES	TOTAL STORES INVENTORY IN CRORES OF RUPEES	PERCENTAGE OF OBSOLETE INVENTORY TO TOTAL INVENTORY
1992-93	NA	NA	--
93-94	NA	NA	--
94-95	7.69	54.38	0.141
95-96	6.37	61.51	0.103
96-97	6.01	75.01	0.08
97-98	8.88	72.66	0.12
98-99	8.12	57.99	0.14
99-2K	15.59	63.18	0.24
2K-01	11.86	54.17	0.21

01-02	16.47	44.58	0.37
02-03	34.90	43.12	0.81
03-04	38.99	45.71	0.85
Mean	15.49	--	--
SD	11.90	--	--
CV	76.85	--	--
LGR	3.82	--	--
CGR	3.25	--	--
r-Value	0.85	--	--
t- Value	5.06	--	--

SOURCE: Annual Administrative Reports of the Corporation from 1994-95 to 2003-04.

NA: Data Not Available



As per the Table it is clear that the obsolete inventory was Rs.7.69 crores in 1994-95 and Rs.38.99 crores in 2003-04, reflecting an increase of 400 percent. It is also clear from the table that the obsolete stores were increased continuously form Rs.8.12 crores in the year 1998-99 to the terminal year of the study, except in the year 2000-01 where it was Rs.11.86 crores. It is found that there is a significant increasing growth of 3.82 percent in obsolete stores during the

period understudy. The corresponding t - value is given by 5.06, which is highly significant at 1 percent level.

On the other hand, the ratio of obsolete inventory to the total inventory shows that, it was 0.141 in 1994-95 and 0.85 in 2003-04. Thus it is clear from the table that the share of obsolete inventory in the total inventory is increased sharply to the higher levels during the later part of the study period and it indicates the inefficiency of the corporation in managing its obsolete inventories. It is assumed that the reasons for abnormal increase in the obsolete stores in the total stores inventory may be due to errors in the forecasting of requirements or sudden changes in the models of buses from time to time by the manufacturers or making the purchases on the basis of the previous consumption without proper planning.

MANAGEMENT OF SCRAP IN APSRTC:

Accumulation of large amount of materials of various kinds which are no longer used for the purpose for which they were originally purchased is a common phenomenon in case of state transport undertakings. A transport undertaking usually consists of hundreds of items of different kinds in large number for its effective fleet operations. With the passage of time and continuous usage of vehicles, engines and tools, results in excessive wear & tear and becomes uneconomical for the effective maintenance of fleet. At this stage these items are treated as scrap.

An effective management of scrap generates substantial returns to the undertaking by its disposal. Disposal of scarp generates not only considerable amount of revenues to the corporation, but also helps in keeping the corporation premises neat and clean. Hence, care must be taken to see that scrap must be disposed off before it gets accumulated into various categories like turnings, borings, plate cuttings, pieces of billets, tyres and tubes, vehicles etc.

The table 2(Fig 2&3) shows the number of vehicles scraped, revenue realized on the sale of scrap vehicles and revenue realized on the sale of per vehicle per Kilometer in paise. As per the table, it is evident that the number of scrap vehicles was increased substantially during the study period. It was 886 in the base year of the study and increased to 1329 in the terminal year of the study, registering an increase of 50 percent. It is to be noted that on an average the corporation is

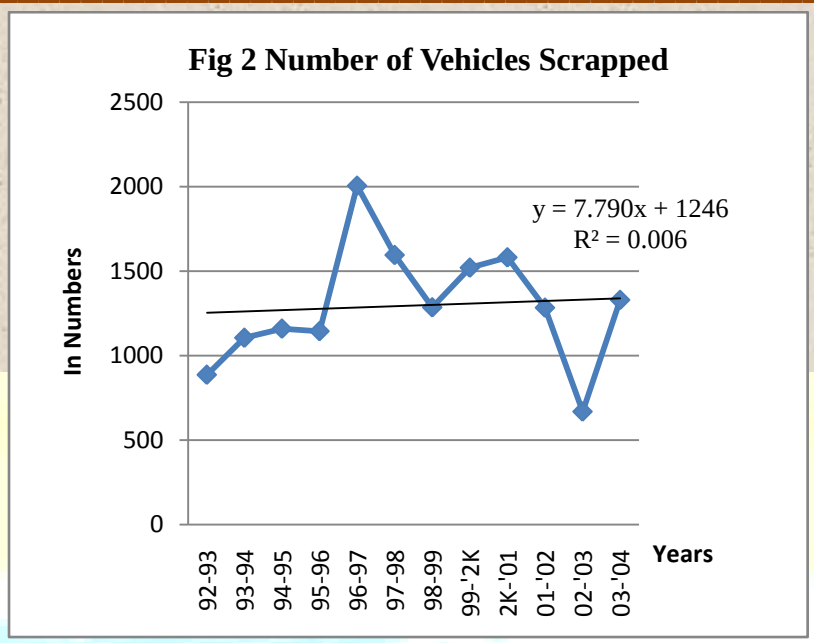
selling an amount of 1300 number of buses as scrap and obtained revenue on an average of Rs.13.12 crores. It is found that there is an insignificant increasing growth of 0.60 percent and 4.23 percent in number of vehicles scrapped and revenue obtained on the sale of scrap vehicles.

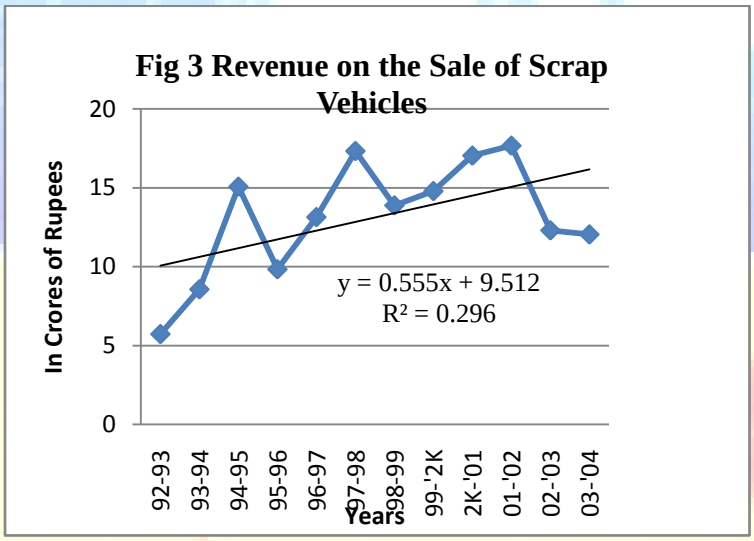
TABLE 2

REVENUE ON SCRAP VEHICLES

YEAR	NO. OF VEHICLES SCRAPPED	REVENUE ON THE SALE OF SCRAP VEHICLES IN CRORES OF RUPEES.	REVENUE ON SCRAP PER VEHICLE PER K.M IN PAISE
1992-93	886	5.73	7.35
93-94	1105	8.57	8.53
94-95	1159	15.08	8.97
95-96	1144	9.84	5.65
96-97	2005	13.15	7.31
97-98	1595	17.34	8.98
98-99	1285	13.89	6.88
99-2K	1520	14.80	7.14
2K-01	1581	17.05	8.27
01-02	1283	17.68	9.15
02-03	668	12.31	5.93
03-04	1329	12.05	5.77
Mean	1296.67	13.12	--
SD	352.36	3.68	--
CV	27.17	28.06	--
LGR	0.60	4.23	--
CGR	0.42	5.54	--
r-Value	0.08	0.54	--
t- Value	0.25	2.05	--

SOURCE: Annual Administrative Reports of the Corporation from 1992-93 to 2003-04.





Similarly, the revenue obtained on the sale of scrap materials along with the revenue in paise per vehicle per kilometer is shown in the table 3(Fig 4). As per the table, it is clear that revenue obtained on the sale of scrap material of the corporation was increased from Rs.9.63 crores in 1992-93 to Rs.14.98 crores in the year 2003-04. It was highest at Rs.15.88 crores in the year 1999-2000. During the study period, it was registered an increase of 55.5 percent, and it is also noted that on an average the corporation obtained an amount of Rs.13 crores on the sale of scrap materials. It is found that there is a significant increasing growth of 3.34 percent in the revenue

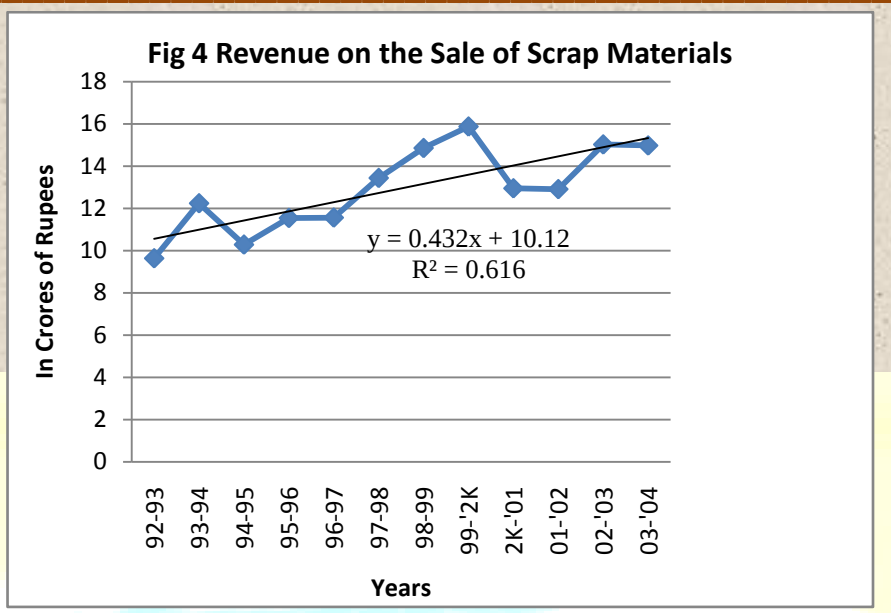
realized on the sale of scrap materials during the period understudy. The corresponding t - value is given by 4.01, which is highly significant at 1 percent level.

TABLE 3

REVENUE ON THE SALE OF SCRAP MATERIALS

YEAR	REVENUE ON THE SALE OF SCRAP MATERIALS (In crores of rupees)	REVENUE PER VEHICLE PER KILO METER (in paise)
1992-93	9.63	6.13
93-94	12.24	7.47
94-95	10.28	6.12
95-96	11.54	6.63
96-97	11.56	6.42
97-98	13.44	6.96
98-99	14.86	7.36
99-2K	15.88	7.66
2K-01	12.95	6.28
01-02	12.91	6.68
02-03	15.03	7.25
03-04	14.98	7.18
Mean	12.94	--
SD	1.99	--
CV	15.37	--
LGR	3.34	--
CGR	3.53	--
r-Value	0.78	--
t- Value	4.01	--

SOURCE: Annual Administrative Reports of the Corporation from 1992-93 to 2003- 04



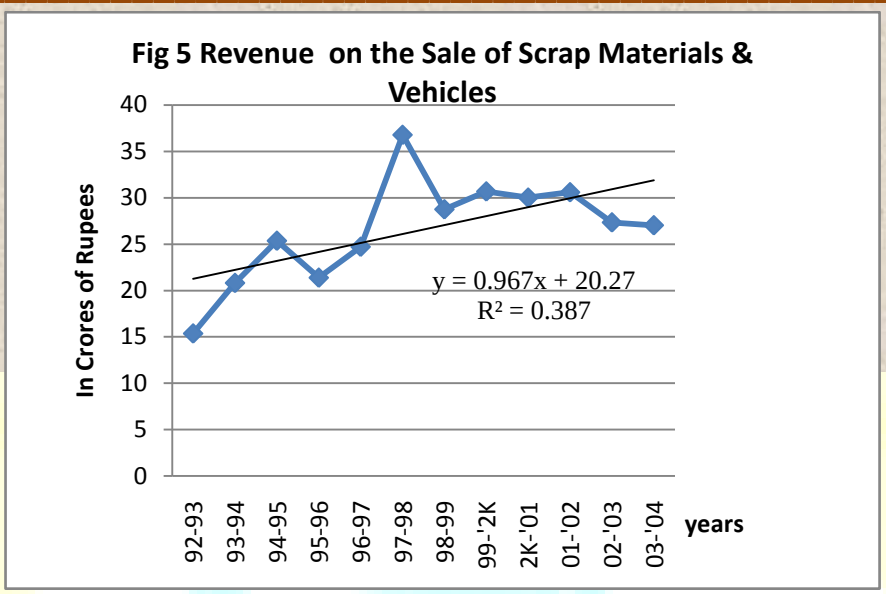
The table 4 (Fig 5&6) shows the share of the revenue realized on the sale of scrap materials and scrap vehicles in the total non-operating revenue. It was Rs 15.36 crores in 1992-93 and Rs. 27.03 crores in 2003-04. It is found that there is a significant increasing growth of 3.64 percent in the revenue realized on the sale of scrap materials and vehicles. The corresponding t - value is given by 2.52, which is highly significant at 1 percent level. Thus, it is clear that the percentage of revenue on the sale of scrap materials and vehicles to the total non-operating revenue of the corporation was increased considerably in the first half of the study period and reduced continuously in the second half of the study period. This analysis indicates what portion of revenue on scrap items constitutes the total non-operating revenue of the corporation. Accordingly the corporation had obtained on an average of Rs. 36.62 out of every Rs.100 of the total non-operating income. It was 43.35 percent in the base year of the study and reduced to 7.89 percent in the terminal year of the study and it was highest 54.65 percent in the year 1997-98. It is found that there is a significant decreasing growth of 9.89 percent in the percentage of scrap revenue to non-operating revenue during the period understudy. The corresponding t- value is given by 4.67, which is highly significant at 1 percent level.

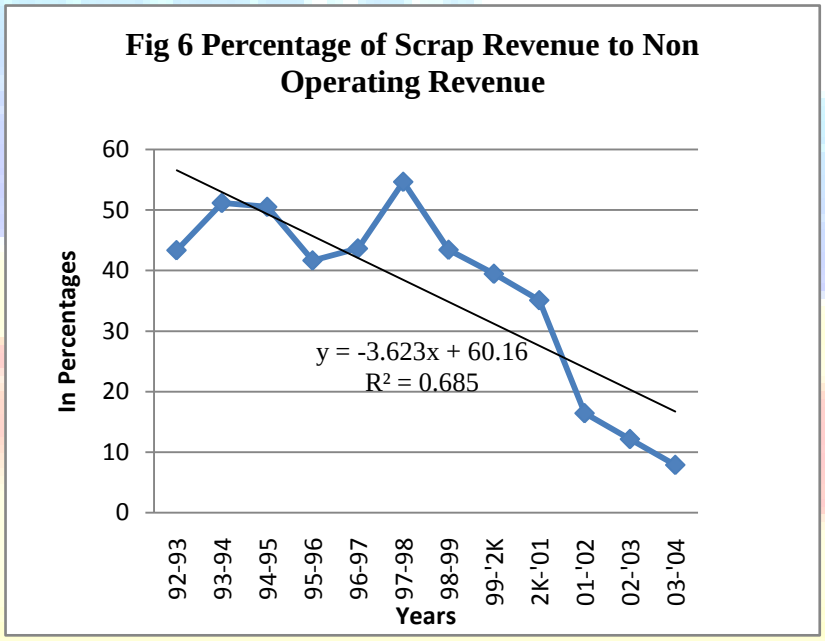
TABLE 4

PERCENTAGE OF SCRAP REVUNUE TO NON-OPERATING REVENUE

YEAR	REVENUE ON THE SALE OF SCRAP MATERIALS & VEHICLES (in crores of rupees)	TOTAL NON OPERATING REVENUE (in crores of rupees)	PERCENTAGE OF SCRAP REVENUE TO NON OPERATING REVENUE
1992-93	15.36	35.43	43.35
93-94	20.81	40.68	51.16
94-95	25.36	50.21	50.51
95-96	21.38	51.33	41.66
96-97	24.71	56.63	43.64
97-98	36.78	67.29	54.65
98-99	28.75	66.21	43.42
99-2K	30.68	77.76	39.46
2K-01	30.01	85.52	35.09
01-02	30.59	186.09	16.43
02-03	27.34	224.69	12.16
03-04	27.03	342.45	7.89
Mean	26.57	--	36.62
SD	5.60	--	15.78
CV	21.09	--	43.08
LGR	3.64	--	9.89
CGR	4.32	--	13.33
r-Value	0.62	--	0.83
t- Value	2.52	--	4.67

SOURCE: Annual Administrative Reports of the Corporation from 1992-93 to 2003- 04





As per the analysis, it is evident that the reduction in the percentage of revenue on scrap items is not due to minimization of scrap but due to drastic increase in the non-operating revenue of the corporation. Similarly the table 5(Fig 7) shows the share of revenue on the sale of scarp items in the total revenue of the corporation. It shows that the share is remaining between 0.96 percent and 1.89 percent during the study period.

TABLE 5

PERCENTAGE OF SCRAP REVENUE TO TOTAL REVENUE

YEAR	REVENUE ON THE SALE OF SCRAP MATERIALS & VEHICLES (in crores of rupees)	TOTAL REVENUE (in crores of rupees)	PERCENTAGE OF SCRAP REVUNUE TO TOTAL REVENUE
1992-93	15.36	1246.98	1.23
93-94	20.81	1251.15	1.66
94-95	25.36	1367.28	1.85
95-96	21.38	1584.96	1.34
96-97	24.71	1735.54	1.42
97-98	36.78	1938.97	1.89
98-99	28.75	2050.40	1.41
99-2K	30.68	2322.26	1.32
2K-01	30.01	2535.55	1.18
01-02	30.59	2406..6	1.27
02-03	27.34	2677.39	1.02
03-04	27.03	2809.72	0.96

SOURCE: Annual Administrative Reports of the Corporation from 1992-93 to 2003- 04.

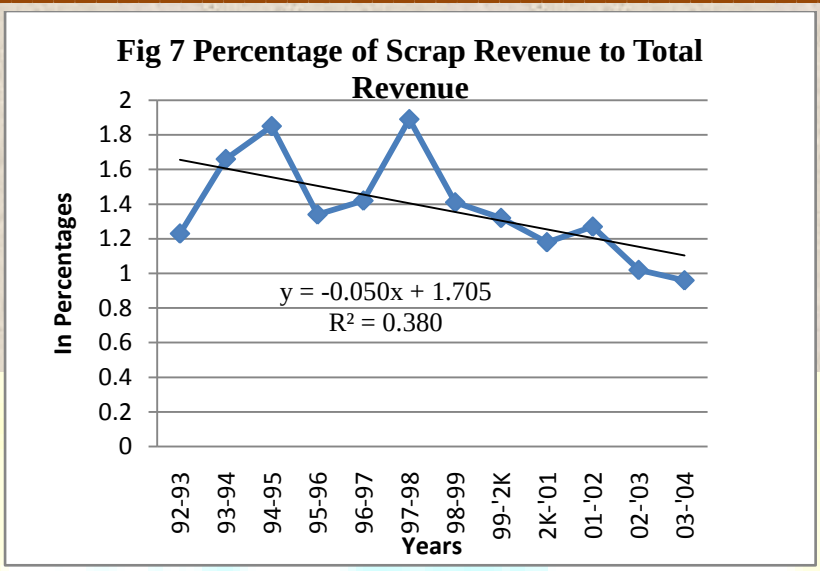


TABLE 6

PERCENTAGE OF SCRAP INVENTORY TO TOTAL INVENTORY

YEAR	SCRAP MATERIALS & VEHICLES INVENTORY (in crores of rupees)	TOTAL STORES INVENTORY (in crores of rupees)	PERCENTAGE OF SCRAP INVENTORY TO TOTAL INVENTORY
92-93	NA	NA	--
93-94	NA	NA	--
94-95	7.51	54.38	13.8
95-96	7.34	61.51	11.9
96-97	8.89	75.01	11.85
97-98	10.83	72.66	14.91
98-99	7.35	57.99	12.67
99-2K	8.05	63.18	12.74
2K-01	8.66	54.17	15.98
01-02	10.39	44.58	23.31
02-03	7.39	43.12	17.13
03-04	8.22	45.71	17.98
Mean	8.46	--	--
SD	1.26	--	--
CV	14.91	--	--
LGR	5.22	--	--
CGR	3.99	--	--
r-Value	0.12	--	--
t- Value	0.39	--	--

SOURCE: Annual Administrative Reports of the Corporation from 1992-93 to 2003- 04.

NA: Data Not Available

The table 6 shows the details about the ratio of inventory of scrap items to the total inventory held by the corporation during the period between 1994-95 and 2003-04. As per the table, it is clear that the inventory of scarp materials and vehicles was Rs.7.51 crores in 1994-95 and Rs.8.22 crores in the year 2003-04. It is found that there is an insignificant increasing growth of 5.22 percent in scrap materials & vehicles inventory during the period understudy. It is also clear from the table that the inventory of scrap materials and vehicles as well as the total stores show an erratic trend during the period understudy. Therefore, it is necessary to study what portion of the scrap inventory constitutes the total inventory of the corporation. It is evident from the table that on an average Rs.15 of the inventory is related to scrap materials and vehicles out of every Rs.100 of the total inventory held by the corporation during the period under review. An increase in the value of scrap inventory to the total inventory indicates that more amounts of inventories are with the corporation. It is clear from the table that the share of scrap inventory to the total inventory was increased in the later part of the study period and it indicates the inefficiency of the corporation in maintaining the scrap inventory. It is assumed that the reasons for the increase in the scrap inventory may be due to failures in the estimation of future requirements, cannibalization and excessive wear and tear of the items. As scrap being a waste, the corporation should take an appropriate action for its disposal in order to make the premises clean and to generate necessary revenue over it.

CONCLUSION:

The analysis of scrap management in APSRTC with respect to obsolete items of the stores indicates that there is an increasing growth of these items during the period understudy. An increase in the obsolete stores involves wastage of material and large amount of capital tied up. Hence, much attention must be given to minimize obsolete items. It is therefore concluded that the reasons for increase in the obsolete stores may be due to errors in the forecasting of requirements or making purchases on the basis of previous consumption without proper planning. Similarly an analysis of management of scrap in the APSRTC, in terms of number of vehicles scrapped, revenue on the materials scrapped, and the revenue realized on the sale of scrap materials and vehicles, as well as the share of scrap revenue in the total non-operating

revenue and in the total revenue, and percentage of scrap inventory in the total inventory, indicate that the number of vehicles scrapped, revenue on the materials scrapped and the revenue realized on the sale of these items are on the increasing side. It is therefore assumed that the corporation is disposing off its old vehicles, which normally consumes more amounts of materials. Further the analysis of scrap revenue to the non-operating revenue and the total revenue indicates a downtrend in the later part of the study period. It is evident that this downtrend was due to increase in the other non-operating income of the corporation and not due to reduction in the scrap revenue. Hence, it is clear that the practices, which are being adopted in the corporation for the disposal of scrap, give good results. It is therefore suggested that the corporation must adopt the same practices in future also to minimize the scrap and to maximize the revenue over it.

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