

# CORPORATE SECTOR AND RURAL DEVELOPMENT

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**"Free Enterprise was born with man and  
shall survive as long as man survives."**

**—A. D. Shroff**

**1899-1965**

**Founder-President  
Forum of Free Enterprise**

## INTRODUCTION

Although India is primarily an agricultural country, with most of its population living in rural areas, both agriculture and rural development have not received due attention. Forum publications over the past 21 years have been emphasising this basic aspect of our economic development. Now there is a general realisation of the importance of rural and agricultural development.

This booklet comprises extracts from two papers prepared by Prof. N. S. Ramaswamy, formerly Director of N.I.T.I.E. in Bombay, and subsequently Director, Indian Institute of Management, Bangalore.

In the first paper, he has pointed out the role which the corporate sector can play constructively in rural development.

This is of interest in the context of the incentive given by the Union Budget 1977-78 to the corporate sector for engaging itself in rural development.

In the second paper, he elaborates on the importance of improving the village bullock cart whose significance to rural transport, employment and development he has been pointing out for several years now.

It is hoped that this little publication will prove useful in stimulating public thinking on these vital areas of India's economic development.

# CORPORATE SECTOR AND RURAL DEVELOPMENT

## I

### SOCIAL MARKETING

**Prof. N. S. RAMASWAMY**

In recent years, there has been a growing awareness of the need to take science, technology and modernization ingredients to the rural areas. Our policy-makers have realized that the country's R & D efforts and the education system in science and technology have not become attuned enough to the needs of the masses. In support of this view, it has been pointed out that basic needs, such as a better design for the plough, bullock-cart and agricultural and service equipment, piped supply of potable water to villages, basic education, medical and public health amenities for the rural population, hygiene and rudimentary veterinary services for work animals are not being catered to satisfactorily through the existing systems. There is a host of other problems, such as poverty, unemployment, illiteracy, afflicting the rural areas that await solution. In the result, it has also been not possible, after many five-year plans, to improve the levels of living of rural people to the extent planned for.

The problems of the rural sector are not yet fully understood by policy-makers. Consequently, many of the programmes for the modernization of the rural sector have not been well conceived. Even in those exceptional cases, where situations have been studied in isolation and selective solutions found, it has not been possible to transmit ideas to the rural people. In our country, agencies of State have hitherto been solely responsible for the development and modernization of the vilages. They have, however, been largely "ineffective, partly due to a lack of knowledge and skills in those to whom such knowledge is sought to be transmitted and partly because of the lack of commitment and motivation in implementing personnel. The tasks of modernization are as

extensive as rural society itself, and the problems inherent in them so stupendous that unaided State efforts are bound to be insufficient. It is in this context, then, that the need for efforts by, and systems of, other organizations and institutions to complement and supplement State endeavour has been felt.

The solution to these diverse and besetting problems and often unsupportable and intractable situations are indeed complex, but perhaps they are inherent in the value structure of the rural society of to-day. The limitations that derive from the kind of social organizations, which rural society has fashioned for itself, exacerbate the problem. The scope of this analysis is, however, restricted in the main to exploring possibilities of contribution by business and industrial organizations as an additional social responsibility towards the modernization of rural society in which they serve and cater for specific needs.

Industrial enterprises with their modern organizations and systems have an obvious role in taking the beneficent findings of science and technology to the villages. During the last few years, national leaders as well as R & D organizations have been applying their minds to finding out ways and means by which business and marketing systems can be orientated to rural development. In the last three conventions of the Science Congress as well as in other meets of professional bodies and academies, the need to do something to accelerate rural development through the application of science and technology has been stressed. Indeed, the FICCI has prepared draft plans of its own for Rural Development and Family Planning. Some industrial enterprises run joint-stock farms simultaneously; others offer apprenticeships and on-the-job training programmes, and yet others carry on incessant research for product development. Some banks and manufacturers of articles of rural consumption have "adopted" villages. All this is welcome. The sale of manufactured goods in the villages on the one hand and the intake of rural produce by industry on the other are two ways in which the industry-rural link is at present being established and developed. While such work has been limited

in the past, there exists undeniable scope for the enlargement of the area of co-operation and interaction. So far, with notable exceptions, industrial units have been condescending in their dealings with villages and concerned only with maximizing their **immediate** returns. Without unduly compromising their long-term objective, it is possible for them so to organize their inter-relationships with rural communities as to improve levels of living among the latter in a number of ways. This is not social service. It is enlightened self-interest—perhaps, self-service with a perspective, because ultimately industry stands to gain through progressively growing outputs which are also marketable.

The larger companies, which can afford to take on this additional responsibility, already do so. It would be unfair to suggest therefore that ours is a novel suggestion. In fact, consistent with their size and the scale of their operations, many of the firms have generously imparted a social as well as clientele service orientation which is moreover adjusted to the needs of specific rural communities. Again, some have gone out of their way to generate jobs for rural people and promote employment in the villages.

Some firms, which have been able to diversify, mix their products optimally and decentralize production, have set up ancillary industries in villages. Yet other merchant houses have formed charitable trusts in the Gandhian tradition, proceeds from which are used to finance the founding and running of schools, hospitals and housing amenities. Educational institutions, for instance, train village artisans for vocations in cottage and small industries. These are instances where State efforts are being supplemented through the philanthropy and enlightened self-interest of manufacturing and trading establishments as well as through the valuable work of voluntary organizations.

As a pre-requisite to further concerted effort by non-governmental agencies, an attempt should be made, in the first place, to develop a body of scientific knowledge which answers to the felt and neglected needs of rural areas, and secondly so to deliver such action-oriented knowledge that it is appropriate to real and unique rural situations. A

fuller understanding of rural problems, both in their immensity and diversity, is, therefore, needed before these two steps can be taken.

By social marketing is here meant the delivery of scientific and technological knowledge as well as skills necessary for bringing up levels of living and work culture so that they do not compare too unfavourably with those prevalent outside the villages. Such services and instructions should preferably be delivered in conjunction with the products and services of industry and commerce which are marketed in the rural areas. What is proposed here is, as we saw, analogous to what is already being done. Only strategies have to be better thought out and spread over greater extent. At present, some industrial firms provide both pre-sales and after-sales services together with the product itself. These services are available in the case of producer and durable consumer goods mostly. For example, when a boiler, computer or electrical installation is sold to a client, he may reasonably expect the following from the supplying firms:

- (i) An assessment of the technical and other needs of the organization;
- (ii) a product designed according to the client's requirements;
- (iii) assistance in the erection of equipment and training of his staff in the operation thereof;
- (iv) after-sales service in maintenance, upkeep, repairs and rectification of situations caused by major breakdowns either wholly free of charge or at nominal cost; and
- (v) the provision of printed manuals, etc., which would enable the client to care for his equipment and gainfully to exploit it to the utmost.

A more pointedly relevant example which would also be more appropriate to the rural context would be the associated services rendered by manufacturers of fertilizers. They help the farmer with soil testing and recommend fertilizer dosages, inter-culture, multi-crop regiments and improved

methods of cultivation. They employ modern techniques of communication as well as marketing to sell contemporary techniques and culture practices, which serve not only to promote fertilizer consumption but to bring science and technology to bear upon wasteful and often retrograde cultivation techniques. This approach can be extended to other products. For example, large companies which at present sell soaps and detergents can arrange demonstrations and the screening of documentaries to illustrate rudimentary concepts of personal hygiene and public health. Likewise, firms making pharmaceutical products can develop films and other mass-media instruments on health care and sanitation. Steel manufacturers would help themselves even more than they help the villagers if they would deign to advise the former on the choice of materials and designs for agricultural implements and also produce graphic aids of lasting value which illustrate the right use of implements and maintenance practices and which ensure long life and impart resale value to the implements. Steel and its alloys enter as raw material in innumerable items being used daily in the villages.

The materials now being used in agricultural equipment are all wrong, and they are not designed scientifically. There has been, in consequence, much wasted effort in the local manufacture of ploughs, pulley blocks, buckets and mason's and carpenter's tools. Steel companies should bestir themselves and start R & D work in order to standardize and publicize new designs, methods of manufacture as well as of field use. Accordingly, they should also diversify their production. This is the minimum they could do to deal with a glut.

The new tyre companies which have appeared on the scene can, as a further example, help in designing bullock-carts adapted to local condition and use, which increase efficiency for given draft capabilities of work animals. Food-processing industries, which yield high returns and, moreover, use raw materials of rural origin, have clearly a great role to play in nutrition education in the villages. Companies which market kerosene and other petroleum products in the rural areas can educate villagers in the economic and



balanced use of all energy — bio-energy, electricity and fossil fuels. Firms producing pump-sets, electrical motors and other electrical appliances used on the farm can arrange demonstrations in the efficient and conserving use of the goods they sell as well as in the optimization of yields. Most importantly, they can advise farmers on the economic use and husbanding of scarce water resources. In fact, such examples can be multiplied endlessly. As against the products of industry sold in the rural areas, the produce of rural areas are procured by industry on a wider and larger scale for processing and use as raw materials and as intermediate products in manufacture. The social marketing ideas outlined above apply, equally to the purchase of rural products by industries. The delivery to the rural areas of the relevant findings of science and technology and ideas for modernization can be mediated by these transactions as well. Improving the product palpably for the benefit of the farmer can be a first step in a continuing process. Often farmers cannot be bothered to deliver clean products of standard quality which conform to specifications partly in the false belief that they get more for larger quantities of sub-standard goods. It is a fact of rural culture in our stage of development that villagers are cynical about quality. That they lose out on goodwill does not enter into their thinking. Moreover, even the wages for the cleaning of produce — foodgrains, jute, cotton whatever — are denied to the rural people for the cleaning is being effected and paid for at the other end of the processing chain. Grading and standardization are two other operations the farmer does not appear to be keen to take on. Even in the case of fruits and vegetables, the grading is done in the market. If the farmer were to do the grading himself, he could probably claim a better average price for his products. If the industry purchasing in the rural areas would only take pains to educate its supplier-farmers and foster the requisite attitudinal changes, the farmer as well as the community at large would benefit. This way, it would work out cheaper for the company in the long run.

The industrial buyers of raw materials could also help in product improvement and diversification of agricultural

operations through appropriate extension methods. Just as the farmer is not aware that the price differential for quality will far exceed any money he expends to ensure this, he is not aware how much more he can earn through switching to a new crop. Both knowledge and willingness, which do not always occur together, can be fostered by the senior industrial partner in this inter-relationship; what is the kind of product to which a given plot of land is most suitable? Which, in a given market situation, is the most profitable crop to raise? Who is the better buyer to go to — one who pays a smaller price and advances money for inputs — or another who pays snap take-over prices? Efficiency may be impaired by lack of finance or lack of specific inputs, and these gaps should be willingly filled by the senior industrial partner. Ability may be impaired also if specific skills for preparing a raw material or making an intermediate product is wanting in the farmer.

Industrial R & D can find new uses for rural products, or enhance the economic value of old ones. I should like to mention two projects in particular which serve to illustrate how, with a little imagination, productive employment in the rural areas could be promoted and widely distributed as well. With its highly experienced and far-flung marketing net-work, one company has successfully augmented rural incomes in Etawah district of Uttar Pradesh. The firm advances quality inputs and seeds as also liberal credit for other uses so that crops of high-quality peas are raised for dehydration and sale in special packings. Its support to mixed farming has likewise resulted in the diversification of milk products and infant foods, which, in turn, have conspicuously shored up urban nutrition standards among vital age-groups. More recently, it has been collecting sal seeds from tribal forests and has been exporting them in processed form for use in chocolate-making abroad. The project is self-financing, generates incomes and employment in a backward area inhabited by a class of people identified as under-privileged and earns foreign exchange besides. This is Management of Science and Technology at its best. The collection of waste paper and scrap metal from town garbage in order to add to scarce national supplies is similar,

but in our terminology, it is a voluntary project in which the people concerned help themselves rather than look to an outside agency for organization or know-how inputs.

These novel marketing principles proposed have great relevance to rural banking which can find extended application therein. Amidst all the exhortations to lend to farmers and increase the share of agriculture in the total credit available to the economy, small farmers and middle-level ones are notoriously shy of borrowing from commercial banks. The money-lender who is now being replaced was a highly sociable member of the village community, (he was indeed a "friend, philosopher and guide," of whom Darling spoke nearly five decades ago) whom the farmer understood well even if he feared him a little. He could be solicitous, understanding and accommodating in a degree that made up for his exorbitant charges. The villager looks for the warm relationships of the family even in a community setting and finds the contractual transactions of modern banking a little discouraging. Also, traditional attitudes of suspicion towards city-slickers appears to die hard. Used to paternalism, many of them want to be cared for. Social banking is a suitable instrument of development because it implies closer emotional links as between the participants in the productive process in the primary sector. Curiously enough, the villager has been more willing to save than to borrow even if he can little afford to do the former. Rural banking therefore calls for much greater preparation by the rural branches of nationalized banks and by the rural banks themselves.

All this is not to deny, however, that banks have made some headway in lending to farmers who have taken to dairying as a subsidiary occupation. The banks can provide information on the choice of a milch animal, its maintenance and the marketing of milk and milk products. Traditionally, milk was "stored" in the form of **ghee**, and in the absence constituents to take to the making of milk products. Alter-of chilling facilities, bankers can persuade their borrowing natively, enterprising bankers can encourage farmers to form themselves into small companies so that their output can be

preserved, chilled and transported to distant city markets. They should, as a rule, befriend the farmers and undertake feasibility surveys for new crops, determine the product-mix in mixed farming, formulate projects on behalf of their constituents and even undertake the training of personnel on their behalf. Some banks already employ agricultural graduates so as to be able to offer consultancy services to borrowers. Isolated cases are also known of banks which lend to would-be artisans who have subsequently repaid their loans from current earnings. The insurance of crops and of farm and milch animals has not made much headway even in the industrialized countries of the west, but there is a crying need for them in India's villages. They can be successfully initiated only through the agency of rural banks, general insurance companies, or industrial institutions which adopt progressive policies of social marketing.

In conclusion, social marketing must be distinguished from infra-structure marketing which refers to the work of public utilities and, say, the local education and health departments. What these latter can achieve by way of modernization is limited by the fact that the disposable surplus from their operations is negligible, if it exists at all. Often, their services are rendered free of charge as in the case of primary education, or they are heavily subsidized as in the matter of irrigation water or electrical energy delivered at the farm.

Organization and management are a critical resource input for a poor nation where the bulk of the work force falls within the non-organized sector, and the Institutes of Management have of late been stressing its importance for the Indian economy. Many industrial enterprises in this country are well staffed by professionals and employ serviceable systems and techniques of organization. They enjoy the advantage, too, of highly motivated staff and pace-setting and **avant grade** standards. Many of them employ field salesmen who visit villages regularly in the process of their legitimate work and have to assess the needs and demands of villagers for their products. Typical products produced and marketed by well-run companies which employ

carefully thought-out systems and techniques of organization are : **vanaspati**, detergents, tea, coffee, kerosene, diesel oil, tobacco, pharmaceutical products, fertilizers and seeds. In the smaller towns and district headquarters, manufactures, such as spares for tractors and trailers, tyres and agricultural implements like power-tillers, are also offered for sale. The considerable proportion of their time which salesmen spend in the villages can be put to better use in the service of social marketing. All that has to be done is to motivate salesmen and restructure their schedule and job content.

Agriculture is one of the most ancient occupations known to civilization, and in this old country of ours, villagers are in great need of entertainment and diversion from the drudgery of routine, the dead hand of the past and the profound tragedy of poor living without surcease, solace or recourse. Villagers are as a result disposed to attend diligently to any impressions brought to bear on their consciousness by way of films, plays and information systems derived from the modalities of their own work culture. By launching on new activities allied to their marketing work, manufacturing firms would stand to benefit in the following ways :

1. They would get to know the villager better who is proverbially slow to speak his mind and whose attitudes are more attuned to stability rather than to change. Such contacts between marketing personnel and village populations can be a fruitful source of feed-back both for extended and intensive selling as well as for the development of new or improved products.
2. In a developing economy, firms, which sell in the rural areas with value added to rural development, are bound to enjoy greater public esteem.
3. Above all, the firms will gain greater exposure for their products among the village public.

Clearly then, advertisement funds if deployed on such innovative strategies would be more fruitfully spent than

on orthodox newspaper campaigns which companies today tend to rely upon heavily.

Each company which launches on a major programme of sales in the villages will have to assess the situation for itself in relation to its products and clientele. Marketing personnel must, therefore, be trained and oriented to their new tasks. Printed literature, films, documentaries and all the tools of modern communication will come in handy in this noble enterprise which would prove highly beneficial not only to the firms but to its clients as well. In a word, **social marketing should become an essential part of product marketing** — both buying and selling in the villages.

## II

### MODERNIZING THE BULLOCK-CART

One of the striking “dualities” about our country is the co-existence of small but well-organized segments of the economy with vast and sprawling non-organized ones. As is only to be expected, the conditions of work and living in the non-organized segments compare unfavourably with those in the modern or the “international” sectors.

There is perhaps nothing unusual about this for, even in the free-market economies of the West, the differences between one firm and another in the same industry can be considerable—in the matter of profits earned, wages paid, or average and marginal costs of the products. But such variations are subtended within a predictable range, and the whole system is in a state of dynamic equilibrium where the less efficient firms tend and aspire to the conditions of the most competitive. In India, the corresponding range is greater and the non-organized sector is larger and often based on antiquated but extant and viable technologies. The tacit and facile assumption is made that the non-organized sector is bound in the foreseeable future to be superseded, totally and at some point of time, by modern variants. “What cannot be cured must be endured”; this need not be true of technology. We must make better what we must live with. Though the unorganized segments account for the bulk

of the activities in the national life, they receive far less attention—than does the diminutive organized sector—from policy-makers, entrepreneurs, the mass media, the opinion-makers and all those in short who matter. Thus, organized industry, organized transport, organized trade, organized labour all capture the public imagination; they are always in the news and few bother about the problems of the corresponding non-organized segments of activity. Yet, part of the object of upgrading the status of the non-organized segments of activity is to make them viable through the induction of organization and systems.

There are several types of animal-drawn carts in use in the country; bullock-carts, buffalo-carts, horse-carts, camel-carts and mule-carts. The bullock and buffalo carts are by far the predominant type of animal-drawn carts in use. Horse and mule-carts are found mainly in urban areas. Camel-carts are localized mainly in Rajasthan. There is little distinction between the carts hauled by bullocks and those hauled by buffaloes. The term bullock-cart signifies both these types of carts. The bullock-cart is used in our country for the transport of men and materials. Its role in passenger transport has been considerably attenuated over the years with the advent of the passenger bus services over routes not covered by the railways. Although motorized traction appears to have made considerable inroads into the goods transport sector, the bullock-cart still plays a major role in the transport of farm produce, fodder, fuel, agricultural inputs, vegetables, construction materials and retail goods in the rural areas. Bullock-carts are used in the cities for freighting vegetables, garbage, dry grocery, general merchandise for the retailers and construction materials. The number of animal-drawn carts in use in the country has been increasing over the years; from 110 lakhs in 1956, it rose to 127 lakhs in 1966, and now the figure is believed to have crossed the 140 lakh mark. In fact, the number of carts has been steadily increasing in all States except Kerala.

The aggregate investment on the system, including the cost of the animals, may well be of the order of Rs. 3,000 crores. This is comparable to the outlay of the Indian

Railways estimated at over Rs. 4,000 crores and on public goods transport (automotive) vehicles (by road) estimated at Rs. 2,500 crores. The bullock-cart is, at present, the principal means of goods transportation as between villages and towns, and for use in traffic between village and village, it is still irreplaceable. According to a study conducted in 1959-60 by the Planning Commission, bullock-carts carried 58 to 96 per cent of the arrivals of produce in five of the country's regional markets.

On the basis of information gathered by IIM-B from over 40 districts, it was found that, at present, an average of over 60 per cent of all goods sent from farm to market, presumably including those for intermediate destinations, was carried by bullock-carts. There is, however, no data on the quantum of goods so carried. In its **Report on Transport** (1948), the National Planning Committee estimated that a random bullock-cart would carry 2000 ton-miles (approximately 3,200 tonne-kms) of freight during an average trip of 10 miles in a working year of 200 man-days. By the same token, the system must now account for more than 41 billion tonne-kms of goods carried during a single year. Incredible as these figures may seem, they are fair approximations—some even under-estimates.

Even 10 billion tonne-kilometres would be a conservative estimate, and does not compare unfavourably with the 180 billion tonne-kms carried by the Railways and 80 billion tonne-kms carried by road transport vehicles.

A fair proportion of the carts are owned and used by farmers to carry, between farm and barn-house, their outputs—mostly agricultural produce and inputs, such as manure, fuel, fertilizers and dry fodder. Such carts are also, on rare occasion, hired out to fellow-farmers and other users. The commercial cartmen, who constitute another category altogether and the economics of whose operations are regulated by other criteria, abound in the cities; but their numbers in the rural areas are as yet small. The exact proportion between farm and commercial carts has not been established; but the latter may not exceed a liberal 20 per



cent. The total number of people employed in the bullock-cart transportation system—directly or indirectly, part time and full time—may be of the order of 200 lakhs. Apart from the direct employment of operators and drivers, whose numbers will equal that of the carts, the system also provides sustenance for those engaged in loading and unloading. Those indirectly employed include the manufacturers of carts and components as well as others who mend them. The maintenance and upkeep of animals also keep a large number of people busy a part of the time everyday the year round, but the recompense, if it can be identified at all, must be meagre or even non-existent.

Although trucks have been replacing animal-drawn carts in certain areas, bullock-carts are bound to remain with us for many decades to come. In the villages, it is the truck and the tractor-trailer that play a complementary role to the bullock-cart in the transport of goods over short distances. Motorized vehicles cannot replace animal-drawn vehicles easily or completely for several reasons. In the first place, trucks are not competitive over short distances such as 5 to 10 km which is the optimum range of the bullock-cart. Secondly, adequate loads are not available for truck operation in farm activity. Thirdly, trucks cannot be operated without well-paved roads which simply do not exist in rural India. Finally, if it were possible to replace all bullock-carts by motor vehicles in rural transportation, it would not be desirable because at the present rate of exploitation, the proven world reserves of petroleum may not last very long. And India must economize.

Animals are a necessary part of farming operations, and farmers will, therefore, continue to own bullocks. The National Commission on Agriculture has estimated that agriculture alone would require 800 lakh animals by the year 2000 A. D. As farming operations are seasonal, a good deal of idle time from ploughing is used in carting; either the animals are hired out or the owner uses them himself. According to a study conducted in Coimbatore and Trichy districts recently, 53 per cent of bullock-time in the former district and 70 per cent in the latter were taken up

by the cart. The proportion of bullock-time to total use taken up by the Persian Wheel, in **gur**-making and for oil extraction by the **ghani** on the north Indian plains must be comparable. In other words, the bullock represents a multi-purpose source of bio-energy. As early as 1956, the Planning Commission wanted multi-purpose farm animals to be bred specifically to their tasks. In order to ensure optimal utilization of animal energy, it is essential that bullocks and other work animals from the farm be yoked to the cart a part of the time.

Adequate attention has not so far been paid to bullocks as a source of motive power and bio-energy and to bullock-carts as a means of transportation. This neglect is mainly to be ascribed to the wishful thinking that animals as a source of draft power will soon be replaced by mechanical contrivances like power-tillers, tractors, harvester-combines, fertilizer and seed-drills and trucks. It is high time that a more realistic appraisal of the situation was made. We may have to live with animal-power for use in a variety of farm and off-the-farm operations since a poor country cannot afford altogether to do away with use of bio-energy as motive power.

As the bullock-cart was considered a passing phase in the development of a transport sector, hardly any effort was made to improve the design of the cart, which, in its present form, has remained substantially unchanged over several centuries. Again, no significant effort to improve the cattle wealth of the country so as to improve their draft power was made. Through a proper manipulation of nature and nurture, (a) it should be possible to reinforce draught characteristics of male calves instead of sending them to slaughter-houses at birth and instead of concentrating on milch-characteristics of female calves. Until recently, farmers preferred male cattle as these would make good work animals about the farm. With two years' maintenance, their value would appreciate to Rs. 1,500 to Rs. 2,000 a piece. Admittedly, some thought was devoted to developing dual-purpose breeds of cattle during the Third-Plan period. But the emphasis has, of late, shifted to the optimization of yields

from dairying, thanks to the claims of mixed farming and Operation Flood. The development of milch cattle is indeed a crying need in this under-fed country; but the development of animal power is no less important.

The modernization of bullock-carts, if it results in the augmentation of carrying capacity, decreased strain to the animals, and the elimination of damage to roads, would give a great boost to the national economy in general and to the rural economy in particular. If the carrying capacity could be doubled (and this has been achieved with pneumatic tyres), the incomes of the rural people dependent on this system would also double. No nationwide data regarding the income generated by the bullock-cart transportation system for a variety of freight, and in cities and in villages, are available. On a conservative estimate, it would aggregate Rs. 1,000 crores, assuming an average working year of 100 days and a daily income of Rs. 10 per cart. Consequent on modernization, this figure could be stepped up to Rs. 2,000 crores and more.

Another advantage to the rural economy which could be consolidated through improved cart design would be contributory employment potentiality it can generate at stable and higher levels of income. Improvement would come as a great boon to the over 200 lakh people employed by the system directly and indirectly, part time and full time. Much of this employment, located in the non-organized sector, would be seasonal and fetch only low levels of remuneration. With improvements in design, the bullock-cart, and the transportation system based on it, could be made viable, and it could be equipped to play a much more stimulating role in the transport economy, particularly in the rural areas. Employment in the bullock-cart system would then be a multiple of that provided by trucks with an equal carrying capacity. The bullock-cart is furthermore an excellent example of appropriate technology for short-distance goods transportation. The capital cost of employing a single notional person in the bullock-cart is just Rs. 3,000 whereas the corresponding figure for the truck system would be ten times that figure. Ours being a capital-scarce, labour-

surplus economy, the relevant technology for us would be labour-using and capital-saving systems, such as the bullock-cart for short-distance transport. As a further advantage, it can use herited skills and need not wait upon the generation of new ones; fresh training calls for massive investments. The new jobs would not be confined only to cart-operators. but would extend to artisans who manufacture and repair them. If the bullock-carts were further neglected, the system would lose out without a fair chance to establish its viability. The carts may well be displaced by automobiles, but employment in the transportation sector would in the process be reduced considerably. On the other hand, if the efficiency of the carts were increased, a viable and autonomous rural transportation sector could be fostered. Its contribution to increasing rural levels of living could be palpably felt within a generation.

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—Eugene Black

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