



# Need for Efficient Management of Infrastructural, Social Services, Governmental, Environmental and NGO Sectors\*

**Prof. Arif A Waqif**

Founder Dean (Rtd.), School of Management, University of Hyderabad  
Former Larsen and Toubro Chair Professor, Dean, Research  
Administrative Staff College of India, Hyderabad, India.

Email: [waqif.arif@gmail.com](mailto:waqif.arif@gmail.com)

## Abstract

*The provision and management of efficient, affordable, accessible to economic infrastructural, social, governmental, environmental and non-governmental developmental services are the back-bone of inclusive socio-economic development. The primary motivation for this paper is to help extend the boundaries and horizons of management practices, education, research, consultancy and training to include economically and socially essential but relatively neglected sectors by managers, management academics do vial scientists, and students. It begins with a brief recall of personal experiences on the need for more efficient management of resources in a variety of not necessarily for-profit but crucial inter-linked sectors, followed by discussions of relevant concepts, benefits, role of decision-makers, some critical perspectives on increasing role of private sector in some of these sectors, alternative and positive developments, and suggestions for integrating these concerns in academic activities of management and social science schools.*

**Keywords:** Public and social goods and services; Efficient management.

## 1. Motivating Personal Experiences and Perspectives

My 20 years at Administrative Staff College of India, Hyderabad, taught me that more efficient management and utilisation of all resources is needed not only in private corporate and business sectors but also in a wide variety of other inter-linked not necessarily for-profit sectors. These include : electric power and energy; public transport; irrigation; public and private construction; preventive and curative healthcare; education at all levels; governments' economic and welfare services; “free” natural renewable and non-renewable resources like water bodies, air, forests, soil, underground minerals and metals; agricultural, rural and urban development; grass roots development and social; enterprises, and many other such sectors.

Relative managerial inefficiencies in these sectors adversely affect the efficiency, productivity and profitability in the private-commercial sectors. But more importantly from larger economic and social perspectives, such inefficiencies also adversely affect general affordable and equitable access to and quality of public, merit and environmental goods and services, and quality of life for all, especially the weaker and marginalised sections of society.

I mentioned to the University of Hyderabad Vice-Chancellor in 1998 that the new management school to be set up at the UoH could have a much broader sectoral coverage as above. He, an eminent physics professor, immediately said:”Yes. Even this university needs better managers.” Large national and international NGOs/social enterprises, based on my experiences, also need finance, HR, social marketing and other managers.

## 2. Relevant Concepts and Illustrative Emerging Issues

Goods and services in the economy-society can be broadly classified as: Private (e.g. personal consumables and durable household assets); Public (e.g. Railways, public road transport, roads, bridges, electric power, public communication networks, government services); Merit (e.g. primary education, primary and preventive and basic curative healthcare, sanitation, potable water);

and “freely available” Natural and Environmental Resources

*\*Based on unpublished keynote address in the Training Workshop at Faculty of Business Administration, Chittagong University, February, 2013, revised and updated in June 2015.*

( e.g., underground minerals and other deposits, air, lakes, rivers, coastlines, forests. agricultural soil and land, natural recreational and other spaces). Distinguishing characteristics of these goods and services are : : relative exclusivity of (free to limited) access; related investment and marginal / average costs of supply and access; relative differences in actual and perceived costs and benefits by users; extent to which they can be efficiently provided privately (by markets) or publicly (by local / national governments); and most importantly, their indirect / externality environmental effects on third-parties / non-users, like pollution and depletion of natural resources, congestion, involuntary displacement of millions of project affected persons, among many others.

These distinguishing characteristics in fact make it obvious that all public and merit goods and services and natural resources cannot be supplied by private profit-oriented producers in competitive markets without incurring huge economic and social costs. In fact, especially in developing countries, affordable and inclusive access too many of these public, merit and environmental goods and services need to be subsidised. E.g., increase in subsidised public urban transport can contribute to lower average costs of transport; lower social costs of congestion; lower depletion of renewable and non-renewable natural resources; and lower levels of pollution, which would be more beneficial to all direct users and affected non-users alike. It is worth noting that annual purchases of private vehicles in Singapore and Malaysia, e.g., are strictly numerically controlled and highly taxed as an alternative, they provide very efficient, comfortable and accessible inter-modal public road and rail transport. Lack of availability of such public transport in India, Bangladesh and Pakistan, e.g., has contributed to exponential increase in private transport, contributing to unsustainable environmental and social costs. More generally, increasing internationalisation of natural environmental resources (NERs) and transport-intensive production and distribution of products like automobiles, electronics, consumer durables and even food products like meats, fish, tea, wines, fruits etc., among many others, contribute to depletion and pollution of natural environmental resources. Such internationalisation also contributes to increasing carbon emissions apart from ecologically unsustainable demands for NERs (on food products, see, e.g., Environmental Costs of Shipping Groceries, 2008; on globalisation of meat markets, see Heinrich Boll Stiftung et al, 2014).

Similar issues also arise in the context of regionalisation of economies. E.g., in the South Asian (SAARC) region, preferential and free trade agreements have been approved by SAARC Summits. The 2010-20 periods has been declared as the Decade of Connectivity. But to promote regional economic and ecological efficiencies, there is a recognised need to integrate cross-border transportation networks (Fredrich Ebert Stiftung, 2010), apart from utilising cross-border complementarities in production and distribution of traded products.

### **3. Expected Benefits**

More efficient management of resources in these sectors can provide financial benefits to the private sectors in particular. More broadly and importantly, it can significantly enhance more inclusive and wider economic and social benefits, especially in favour of those at the bottom of the economic and social pyramid. These can include lower unit costs and better quality, reliability and more affordable access to essential public, merit and free natural and environmental goods and services. E.g. more cost-effective, reliable and better quality of supply of electric power, public transport etc would not only contribute to productivities and efficiencies in the industrial, agricultural and service sectors, but also to more satisfaction among all consumers.

More specifically, effective collection and eco-friendly disposal of bio-degradable and electronic wastes at local levels can help contribute to overall improvement in the quality of local environment. More broadly and usefully, efficient planning and management of these resources in these sectors can also enhance direct and indirect employment opportunities. India's Central and State government services and public sector units and banks offer thousands of jobs annually even for fresh graduates and post-graduates (Muavin, 2014).

Table-1 below highlights the extent of expenditures and employment potential for India.

Part from above employment opportunities in Government of India and Andhra Pradesh (now Telangana and Andhra Pradesh) the following numbers of specific jobs are expected from India's 12<sup>th</sup> Five Year Plan (2012-17) in the infrastructure sectors – Table 1 – and in Renewable Energy Technologies (RET) – Table 2 below.

**Table 1: India's 12th Five Year Plan**

S. No.	Sector	Rupees in Trillions	Share of Construction (Percent)
1.	Power	13.5	38
2.	Roads	9.69	63
3.	Railways	5.19	78
4.	Ports	1.97	65
5.	Airports	0.87	70

Source: Government of India 2012-17

Sector-wise projected investments is rupees 11 trillion per annum, and rupees 55,00,000 crores, or 55 trillion, or USD 1 trillion over a period of 5 years. A conservative estimate of 1 job per the investment of rupees 1 million generates 11 million direct jobs and 16.5 million total jobs on applying a 1.5 job multiplier for backward and forward linkages sectors. Even the direct demand for labour in renewable energy technologies – solar, biomass, wind – is expected to increase exponentially.

Part from above employment opportunities in Government of India and Andhra Pradesh (now Telangana and Andhra Pradesh) the following numbers of specific jobs are expected from India's 12<sup>th</sup> Five Year Plan (2012-17) in the infrastructure sectors – Table 1 – and in Renewable Energy Technologies (RET) – Table 2 below.

Based on averages of the ranges, expected increases in jobs in a) Solar: 115 times; b) Biomass: 3 times; c) Wind: 1.1 times.

Total installed capacities in MWs in RET -- solar, biomass, wind -- expected by the Ministry of Non-Renewable Energy, Government of India, are 21,071 in 2012, 86,497 in 2017, and 59,250 in 2022. Manufacturing, construction and installation, operations and maintenance, and fuel processing are emerging types of jobs in RET sectors.

**Table-2: Range of Total Existing and Projected Jobs -- Selected Sectors, in numbers**

S. No.	Sector	Existing	2017	2022
1.	Solar	2,000-2,700	62,000-77,800	1,88,000-3,57,500
2.	Biomass	1,80,500-7,80,800	2,89,500-13,17,000	5,23,000-23,21,600
3.	Wind	8,900-38,300	10,000-4,40,000	13,650-60,060

Source: Jain & Patwardhan (2013, February 16)

Based on averages of the ranges, expected increases in jobs are a) Solar: 115 times; b) Biomass: 3 times; and c) Wind: 1.1 times.

Thus, millions of jobs annually will be available from the planned investments Government of India generally, and from projected growth in renewable energy technologies, during the coming years.

**Table-3:** Sector-wise Composition of India's GDP Expenditures (Rs millions), per cent of GDP, and Estimated Workforce (millions) – 2013-14

I - a) Total GDP expenditures Rs 99,211,000.

b) Estimated working population 500 million.

c) GDP/ worker (a/b): Rs 198,422 million.

II – Sector-wise Expenditures and Estimated Employment

a) Public admin etc Rs 12,401,000 mil; 12.5 %; 57 mil.

b) Gross capital formation Rs 30,502,360,000 mil; 30.7 %; 154 mil.

c) Electricity, gas, water supply Rs 72,300 mil; 2.3 %; 11.6 mil.

d) Private final consumption Rs 537, 941, 000; 57.5 %; 272 mil.

Total estimated workforce from above: 495 mil.

III – Social and Infrastructural Sectors

a) Education Rs 3,075,541; 3.1 %; 15.5 mil.

b) Health Rs 1,289,743; 1.3 %; 7.15 mil.

c) Transport Rs 6,051,771; 6.1 %, 31 mil.

Sources: *Manual, Infrastructural Statistics,; Indiabudget.nic.com*

It is seen from the above table that relatively large proportions of the GDP expenditures are for public goods and services.

More specifically, as shown in Table 4 below, investments and employment opportunities in various infrastructural sectors look promising

**Table-4** Total Projected Investments and Estimated Employment in Infrastructure, from India's 12th Five Year Plan:

a) For 5 yrs: Rs 55,00,000 crs, or Rs 55 trln, or US \$s 1 trln

b) Sector-wise projected investments over 5 years, Rs trln, and share of construction

◆ power : 13.5; roads : 9.69; railways : 5.19; ports : 1.97; airports : 0.87

◆ share of construction, per cent : power : 38; roads : 63; railways : 78; ports : 65; airports : 70

c) Annually: Total annual investments Rs 11 trln

◆ Direct Jobs conservatively @ 1 job for say each Rs 100 mln invst : 11 mln

◆ Total Jobs (direct and indirect) @ 1.5 job multiplier for backward and forward linkages sectors: 16.5 mln

◆ Total working population about 450 mln

Source: *Government of India 2012-17*

Even the direct demand for labour in renewable energy technologies – solar, biomass, wind – is expected to increase exponentially.

Table 5: Projected Investments and Employment in Renewable Energy Technologies (RET)

a) RET Sectors : - i) Solar; ii) Biomass; iii) Wind (Tables 1 & 2 in Source below)

b) Total Installed Capacities in MWs in RET - Expected by GoI Ministry of Non-Renewable Energy (Table 5) :

2012 : 21,071 b) 2017 : 86,497 c) 2022 : 59,250

c) Types of Emerging Jobs in RET Sectors (Tables 1, 2, 3, 4) :

Manufacturing; Construction and Installation; Operations & Maintenance ; Fuel Processing

d) Range of Total Existing and Projected Jobs - Selected Sectors, in numbers (Table 6) :

\* Existing : Solar : 2,000-2,700 Biomass: 1,80,500-7,80,800 Wind: 8,900-38,300

\* 2017 : Solar : 62,000-77,800 Biomass: 2,89,500-13,17,000 Wind: 10,000-4,40,000

\* 2022 : Solar : 1,88,000-3,57,500 Biomass: 5,23,000-23,21,600 Wind: 13,650-60,060

-----  
- Based on averages of the ranges, expected increases in jobs in a) Solar: 115 times; b) Biomass: 3 times; c) Wind: 1.1 times.

Source: Jain Manish et al., 2013

Total direct and indirect (forward and backward-linked) employment opportunities can be much higher by approximately 60 percent.

It is seen from above tables that the infrastructural and governmental sectors have large investments and employment potential. Thus the social sciences and management faculty should be interested in preparing more sectorally wide-based curricula, and encouraging students to explore these wider employment opportunities.

More broadly still, effective planning and implementation of relevant policies, strategies and projects in these sectors can contribute to higher all-round resource productivities, human development, more equitable and inclusive balanced development, and quality of life across the economy and society, that is, positive third-party effects or externalities.

Historically in the USA, e.g., east-to-west railway and north-south canal networks were promoted by the federal government during the 19th century to encourage more regionally balanced economic development and employment across the country.

#### 4. Role of Decision-Makers and Managers

Decision makers and managers in all the above sectors, especially in government, have access to huge quantities of financial, human, organisational, technological and material resources, far exceeding those available to the private sector. Their resource allocation decisions can not only promote the provision of private, public, merit and environmental goods and services but also to eco-sustainable utilisation of freely-available natural environmental resources and lower depletion and pollution at local, national and international levels. These can be favourably influenced by opinion makers like academics and managers in all sectors.

But their abilities to do so are subject to the constraints of : relative lack of awareness and sensitivity to wider economic, social, environmental and developmental impacts; insufficient availability and access to resources; monopolistic and oligopolistic market structures; relative lack of effective policies and regulations and implementation at all levels of government and international and multi-lateral agencies; lobbying by organised powerful vested private and public interest groups; inadequate political and administrative wills and public accountability; and, perhaps most importantly, insufficient and ineffective participation of the unorganised and most affected sectors. Additionally, increasing corruption at all levels, public agitations, local and national shut-downs, strikes, criminal activities, and extremist violence contribute to inefficient utilisation and management of resources in all sectors.

A Latin American economist (De Soto, 1089) asked slum dwellers a) whether they were better off than five years ago and b) whether they expected to better off five years hence. His hypothesis was

that if the answers to both these were “Yes,” benefits of economic development were expected to “trickle down” to lower layers of the economic and socio-political pyramid. They could then be expected to be more cooperative than disruptive, subservice, or criminal. He further argued that slum dwellers are more resourceful and enterprising entrepreneurs, managers and workers. They not only survive but improve their economic well-being despite : inadequate access to basic and essential infrastructural and social services; overwhelming dependence on usurious money lenders and relative lack of access to bank finance; dependence on unorganised traditional rather organised modern technologies; relative lack of access to organised input and output markets, government support, labour protection laws, etc. He therefore suggested that officially legitimising their informal livelihood activities, providing them with greater and affordable access to basic well-managed infrastructural and social services, policy and legal support, and access to organised markets would help enhance their productive and remunerative contributions to local and national economies, their welfare, and would increase their sense of participation in the economy and society, and reduce socially and criminally disruptive activities.

### **5. Implications from Increased Roles of Private Domestic and Foreign Enterprises**

Entry of private domestic and foreign capital/enterprises in a fairly free and competitive market environment can result in more efficiently produced and marketable and reasonably priced private goods and services for those who can afford them – e.g., 300-400 million middle and upper class Indians. But as Adam Smith (Smith 1776/1964) had noted nearly 250 years ago, in a seldom referred passage free competition is beneficial to consumers and users. But established producers would rather control the market shares and prices. Unless markets are publicly and effectively regulated, dominant private interests would combine and work against the “public interest”.. Though new producers would like to enter the market, the older ones would rather restrict their entry. Jagdish Sheth et al. (Sheth 2010), in their book based on extensive empirical historical research, argued that whenever new products in automobile, radio, TV, electronics etc were introduced; dozens of producers initially entered the market. But in the longer, run three producers (“Rule of Three”) gained control of the market. The latest structure of mobile phone markets in India is dominated by three major suppliers.

In the case of public, merit and environmental goods and services, increased privatisation has resulted in higher unit prices, more limited access, higher air and water pollution and depletion of natural resources, and not necessarily more efficient supplies. This has been the experience not only in India but other developing countries. Lower economic strata especially are faced with higher and less affordable prices in basic infrastructural services, housing, transport, healthcare, education, to mention a few obvious ones.

Privatisation of mines in India has resulted in excessive and environmentally unsustainable extraction and depletion of underground resources, deforestation, de-agriculturisation of land, corrupt practices, and more socially-economically importantly, displacement of millions of local persons dependent on natural resources for their livelihoods. These undesirable impacts are observed even in the case of public or private power and transport projects, special industrial and economic zones, etc., in India and many developing countries. An earlier estimate of project affected involuntarily displaced persons since Independence in India was about 50 million.

In particular, World-Bank promoted privatisation of urban public transport in various cities across the world resulted in : curtailment of services on “non-economic” routes and hours; demands for longer and allegedly unsafe duties for drivers and other staff; relative unavailability of organised maintenance, and crowding of public streets by parking of private buses, among other inconveniences to the public at large. Similar economic and social costs were experienced when merit goods like potable water and sanitation were privatised in many countries, especially in Latin America, but also in India.

Given the inevitable and unstoppable commercially-driven privatisation, liberalisation and globalisation, Nobel Laureates Joseph Stiglitz (Stiglitz 2010), Amartya Sen and other learned scholars, most recently like Aquiel Ahmad (Ahmad 2013) have been attempting to articulate a “development space” beyond “growth fetishism.”

Academics especially in social science and management disciplines need to extend the boundaries and horizons of their research, consultancy, teaching and training activities to a wide variety of sectors, to help fill this development gap. A few relevant and feasible approaches toward this are suggested in section VII below.

## 6. Alternative and Positive Developments

There is an upsurge in public awareness of the need for more investments, efficient management and user and environment friendly supply of public, merit, environmental and developmental goods and services. E.g.:

- As co-chairman of The Federation of Andhra Pradesh Chambers of Commerce and Industry's annual awards jury for two years, I learned that at least four of some 35 annual awards were for eco-friendly profitable private enterprises in Andhra Pradesh.
- Govt of India has allocated nearly US \$s one trillion for infrastructural development during 2012-17 (Table 1 above), including non-conventional energy sectors as discussed above, 47 per cent of which is expected to come from private sector (Table 2 above).
- In its annual report two decades ago the World Bank (World Bank, 1994) had argued that infrastructural investments in developing countries have to come mostly from governments.
- In India, central and state governments are promoting the development of non-conventional energy, energy conservation, more eco-friendly resource use, and lower pollution levels through their various department and boards. E.g., in a TV ad by central petroleum conservation organisation, the father keeps the car engine running while waiting for a green light. His school-age son says: "Dad, this way there will be no petrol left for me when I grow up."
- The Confederation Indian Industry several years ago set up an eco-friendly Green Business Centre – sponsored by the Godrej Group - in Hyderabad. Constructed from recycled building materials (fly ash bricks from coal based power plants etc), it significantly reduced water and electricity consumption through eco-friendly structural designs and recycling. The additional costs of structures etc were expected to be paid back within 3-5 years by lower costs of water, power etc. These were revealed during the inauguration of GBC by Dr Abdul Kalam, then President of India in 2003.
- Municipal authorities in Hyderabad and elsewhere have been encouraging rain water harvesting, recovery and re-use by promoting subsidised rain water harvesting structures by household and localities, though not very successfully.
- Commercially viable eco-friendly and natural resource conserving private residential colonies are operational at least in Bangalore, as revealed in a seminar organised by Tata Consultancy Services in Hyderabad in 2004.

But a survey by an MBA student at University of Hyderabad revealed that very few civil engineers, contractors and builders were aware of more eco-friendly construction technologies and recycled materials. A survey of management schools in India conducted at the University of Hyderabad also revealed a lack of awareness in their curricula about impacts of managerial decisions on public, merit and environmental goods and services. Encouragingly though, the University Grants Commission and All India Council for Technical Education have been issuing circulars to their constituents for introduction of courses on environmental awareness in all disciplines, though not very successfully.

However, on the brighter side, the supplier-consumer interface in water, electricity, transport and other public services through their call centres in Hyderabad and Delhi at least has become much more user-friendly and complaint-responsive.

But it follows from above discussions that there is an urgent need to make the entire management and social science community more aware of, sensitive and responsible for delivering more efficient, affordable and accessible goods and services in infrastructural, social services, governmental, environmental and development by social enterprise sectors.

## 7. Suggested Strategies for Integration in Academic Activities

The above-mentioned broad-based concerns and benefits of more efficient management of public, merit and environmental and social goods and services can be integrated in academic strategies and activities, as suggested below:

- a) Academic administrators to provide the necessary “will” academic and curricular space and facilities in these areas
- b) Faculty to add to own academic value in these areas through organised and self training, consultancy, research, paper presentations and participation in relevant conferences and workshops, etc.
- c) Students to be encouraged to take-up field based projects for academic credit in the development of local public, merit and environmental goods and services, including effective organisation of local residents and communities. Eg, Postgraduate Institute of Management, Colombo, organised field-based student projects for rehabilitating and resettling communities and restoring productive resources devastated by the 2006 Tsunami.
- d) Expert guest speakers from private, public, governmental and social sectors to be invited.
- e) Periodic student festivals on economic and social infrastructure development and eco-friendly management to be organised on their campuses.

## References

- [1]. Ahmad, Aqueil, (2013); *New Age Globalization – Meanings and Metaphors*, Palgrave-Macmillan, New York, 2013, pp. 303.
- [2]. De Soto, Hernando, (1989); *The Other Path – The Invisible Revolution in the Third World*, Harper & Row Publishers, New York, xxvii +271 pp,
- [3]. *Environmental Costs of Shipping Groceries Around the World*, (2008), pp. 2. <http://www.nytimes.com/2008/03/26/business/worldbusiness/26food.htm>
- [4]. Friedrich Ebert Stiftung, (2010); *Regional Consultations on Enhancing Intra Regional Connectivity in the Decade of 2010-2020 – Issues and Approaches in South Asia*, New Delhi, 71 pp
- [5]. Government of India, *Twelfth Five Year Plan, (2012-2017)*, Planning Commission, New Delhi.
- [6]. Heinrich Boll Stiftung and Friends of the Earth, (2014); *Meat Atlas*, Berlin and Brussels, 68 pp
- [7]. Jain, Manish and Anand Patwardhan, (2013); "Employment in Renewable Energy Technologies," *Economic and Political Weekly* vol XLVIII, no 7, Feb 16, pp 84-89
- [8]. <http://indiabudget2015.nic.in>
- [9]. *Manual of Infrastructural Statistics (2012)*; Central Statistical Organisation, GOI, Delhi.
- [10]. Muavin, (2014); *Securte Jobs*, compiled by N Ravinder Reddy and Arif A Waqif, Mutual Assistance for Voluntary Institutions (MUAVIN), Nizam's Charitable Trust, Hyderabad, pp. 154, also accessible on [www.muavin.org/publications](http://www.muavin.org/publications).
- [11]. Sheth, Jagdish and Rajendra Sisodia, (2010), *The Rule of Three: Surviving and Thriving in Competitive Markets*, Simon and Schuster (HB) /Free Press (PB), New York, pp. 288.
- [12]. Smith, Adam, (1776); *The Wealth of Nations – An Enquiry into the Nature and Causes*, Everyman's Library, New York, Two volumes, xvi + 441 and 455 pp.
- [13]. Stiglitz, Joseph, (2002); *Globalization and its Discontents*, W W Norton & Co, New York, Penguin Books India, 2003, Delhi,
- [14]. World Bank, (1994); *World Development Report*, Washington/New York.