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Confusing means and ends: framework of restructuring, not privatization, matters most

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Abstract
Although a great deal of emphasis has been put on it, privatization of infrastructure is only a means to an end, and not an end in and of itself. The goal is a more efficient sector delivering quality service while fulfilling its social responsibilities. Privatization is only an effective means towards the achievement of that result if it is done in the context of an appropriate market and regulatory/legal framework. In the absence of such a framework, privatization can, as experience has demonstrated, compound problems. There are a number of explanations as to why privatization has been carried out in the absence of a proper framework. Those explanations are useful to explore because they point to incentives to which many governments have been attracted, but which proved to be dangerous pitfalls. Some of the consequences of these attractions hold lessons for other governments and lenders to learn. The critical issue in reforming infrastructure industries is not privatization, but rather the framework within which restructuring occurs.
It is time to move beyond stereotypes, faith, and ideology and examine infrastructure privatization in the practical and relevant terms of what it is and how it is actually being carried out. In and of itself, privatization is neither good nor bad. It is a means to an end, not an end in itself. Like all means, it should be employed where the circumstances warrant it, and should certainly not be used indiscriminately. Perhaps even more important, it cannot be carried out in a policy, market, and regulatory void.

It has been an article of faith for the past decade that privatization is the correct path for infrastructure in developing (and even developed) economies. Whatever the problems, believers contend privatization is the solution. Indeed, privatization has been viewed as a necessary ‘reform’ by international lenders, donors, and opinion leaders. There are a number of reasons both micro and macro, for this belief. State-owned infrastructure industries, it is argued, were inefficient, politicized, non-commercial, and costly to the economy, socialized risks, and were unable to attract the capital required to meet the escalating demand for service. In some cases, these characterizations had the ring of truth. However, such views became the stereotypes upon which many policy decisions were premised. Accurate or not, they often helped to justify privatization decisions that were, in fact, driven by circumstances in which governments were burdened by debt and unable to meet social demands. Selling state resources, or at least reducing the demand for state-supplied capital or subsidies, became an essential element of financial salvation for the state itself. In short, stereotyping the public sector, whether accurate or not, justified decisions that were mostly driven by macroeconomic circumstances.

Unfortunately, these stereotypes became a kind of indiscriminate motivator for many policy makers throughout the world. Critical variables such as the effectiveness of state stewardship, the social demands made on infrastructure, the availability and cost of private capital, the effective utilization and allocation of natural resources, legal and regulatory frameworks, and even cultural mores, were often reduced to secondary or tertiary considerations at best. Thus, the drive to privatize became an article of faith. One high-ranking official of a large multilateral lender pronounced Brazil’s troubled efforts to privatize its energy sector a ‘success to be emulated’ simply because

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1 The term ‘privatization’ is used in the broadest sense for the purposes of this paper. It contemplates the full spectrum of options ranging from attracting private capital into state-owned enterprises, through entry of fully private projects into a heretofore state-dominated sector, and continuing through the sale of state-owned assets.
privatization had been carried out. Presumably, in his view, no further inquiry was required.

There is now a significant base of experience around the world from which we can derive lessons that need to be learned. One of these lessons is that privatization works well only where an appropriate restructuring framework exists into which privatization can fit. The importance of the restructuring framework cannot be understated in determining the ultimate success of the entire effort. For that reason, it is important to examine two critical matters:

- why the framework is either non-existent or inadequate in so many cases; and second
- what the consequences are for attaining objectives where the framework has proved deficient.

**The restructuring framework**

In privatization, it can be persuasively argued that getting the contextual framework right is the most crucial element of success. Similarly, a case can be made that in ascertaining the value of privatization, the sequence of decision-making is also essential. Leaving aside political considerations, merely privatizing government assets is not a particularly complicated matter. What is complicated is weighing and successfully balancing all of the relevant interests that will be served by privatization, and creating the policy framework, particularly regulatory and market, within which those interests can best be served and protected. The sequence and timing of these decisions are absolutely critical to the success of privatization.

To be successful, privatization must be conducted transparently and be disciplined by either competition or independent regulatory oversight, or both. It requires that the public policy, regulatory, and market structures be articulated, or perhaps even better, be in place before private capital is deployed. The track record of infrastructure privatization in the absence of those frameworks is dismal. Notable examples are Dabhol in India, Hub River in Pakistan, Rio Light in Brazil, and several private power agreements in Indonesia. In each of these cases, contracts were entered into, or licences granted, in an almost complete policy, regulatory, and market structure void. With the exception of Rio Light, the contracts were let in the absence of a transparent competitive process. In all of the examples, there was no effective regulatory oversight of the transactions. When subsequent

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2 'Success' is defined as improvement in productivity, quality of service, continuing ability to attract capital, and meeting services demands.
events called these transactions into question, there was nothing other than a contract/licence to fall back upon, and, in all cases, those documents proved to be rather unreliable.

In notable contrast are the relative success stories of infrastructure privatization in Argentina, Chile, New Zealand, and Spain. The common denominator that links these experiences is that the governments decided and articulated, either before or concurrently with privatization, the policy objectives, market structures, and regulatory systems. Additionally, the actual privatization process was disciplined by transparency as well as by competition or regulatory oversight, or both.

The logic behind the need to make policy, market, and regulatory decisions before or at least concurrent with privatization seems incontrovertible from both an investor’s and a society’s point of view. Society’s interest, of course, is to assure that a nation’s resources are efficiently deployed, that social needs are met in a reasonably efficient manner, that the availability and quality of service meet expectations, and that sufficient resources are available to meet new demands. A private investor’s interest is to understand fully the regulatory and market rules, social expectations, incentives, risks assumed, and the sustainability of the proposed system. These factors are key in deciding whether an investment is worth undertaking, and the amount of capital that can be put at risk. Therefore, for both the private investor and society, the advantage of conducting the actual privatization in an open, transparent manner, subject to the external discipline of either competition or independent regulatory scrutiny, or both, seems self-evident.

If conducting transactions and sequencing decisions openly and transparently are so obvious, why do so many governments and private investors deviate? Unfortunately, there is no single reason, but there are a number of explanations worthy of mention. The first is that the motivation for privatization is often derived from a country’s macroeconomic position, rather than a sector-specific problem. If the government is so burdened by debt that it cannot meet its pressing social needs, it may decide that its only alternative is to sell state-owned assets. The inherent incentive in such circumstances, of course, is to derive the maximum revenue from the sale of the assets. This incentive constitutes a temptation that is extremely difficult for governments, especially finance ministries and central banks, to resist. The incentive is greatly intensified by pressure from multilateral

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3 New Zealand elected not to have any regulatory agency, but that decision was taken in advance of the privatization. The decision is now being reexamined in several quarters.
lenders to get state-owned assets off the government’s balance sheet quickly. The temptation, then, is to offer terms and conditions so attractive that prospective buyers are willing to hike up the price. Stated differently, short-term considerations such as the revenue contribution to the treasury overwhelm longer-term considerations such as efficiency, service quality, accountability, and the sustainability of the new regime. The greater the burden of obligations placed on an investor, presumably the less money the investor will put on the table. In short, the desire to sell assets at the highest possible price makes many governments reluctant to impose terms and conditions that might reduce the price. Interestingly, in several situations, the attraction to investors has proved unsustainable over time. Many investors have not done as well as they originally believed. Controversies in Argentina, Australia, Brazil, England, India, Indonesia, and elsewhere, bear witness to this phenomenon.

A second explanation why governments are often tempted to get the decision-making sequence wrong is simply that an opportunity may present itself in the form of an investor who has a specific proposal. Indeed, such ‘opportunities’ may not only present themselves, but the prospective investors, often with the support of their own government, may well pressure the government to take up the transaction. The controversial Dabhol Power Station in India (discussed below) is one example. Such pressure often overwhelms the reservations that might otherwise be expressed, making it more likely that the deals made will not be transparent or fully subjected to the external disciplines of competition or independent regulatory reviews.

A third explanation for less optimal decision-making derives from pressures imposed from outside the country. Multilateral lenders such as the IMF (International Monetary Fund), the World Bank, regional development banks, and bilateral aid donors often impose conditions on loans or grants, which compel governments to shift assets off their balance sheets within a relatively, often arguably, unreasonably short period. Meeting these conditions often allows little time to examine all the complexities associated with privatizing infrastructure industries. While many lenders and donors recognize, and are willing to finance, efforts to establish regulatory and market institutions, the availability of funds to undertake these efforts is rarely commensurate with the enormity of the work to be done. Moreover, the availability of such financing is not always contemporaneous with the deadlines to be met for privatization. The funds available for establishing what might best be described as the infrastructure of privatized infrastructure are often either inadequate to the task or only available sporadically.
A fourth explanation is the sheer complexity of establishing the regulatory and market structures for basic industries like energy, transport, water/sanitation, and telecommunications. Transitioning from state ownership to private ownership is difficult in and of itself because it involves rethinking all of the paradigms underlying these industries, and making a fundamental change in the culture of those industries, and perhaps of society as well. The complexity is vastly compounded by the fact that the shift to private ownership is often accompanied by what is arguably an even greater paradigm shift, namely that of moving from monopoly to competition. This task is truly daunting, but it is fundamental—economically, socially, and culturally.

The enormity and complexity of establishing these market structures are often so intimidating that they are undertaken haphazardly. It is easy to underestimate the resources and time needed, and it is virtually impossible to anticipate all of the problems and circumstances that may be encountered. As a result, the first attempt is almost certain to be fraught with mistakes, necessitating a sustained effort over a long period that often extends well beyond the time frames mandated for privatization and when funds are available for the effort. This sustained effort is rendered more difficult by the fact that investors will, understandably, look for certainty in a situation that ought to be fluid by definition and necessity. The result of the interplay of complexity and cross pressures is that it is often easier for officials to adopt a course of least resistance, privatizing before a framework is in place, and thus leaving less flexibility for subsequent change or future reform.

A fifth explanation for getting the sequence and, perhaps, the substance of decision-making wrong, is that the global amount of private capital available for investment is finite and the competition for it is fierce. Private capital is highly mobile, both in terms of geography and sector. Countries trying to attract private capital for infrastructure compete both with other countries and other sectors of the world economy that investors might be inclined to view as more lucrative. To make infrastructure investments more attractive, officials often may feel compelled to set aside sound policy-making in order to successfully compete for capital. Often, assets are privatized but risks remain socialized. For small countries with little leverage in world capital markets in particular, the temptation to do so is often impossible to resist. The privatization of Copper Belt Energy in Zambia, where some of the electric transmission and distribution assets were put in private hands, but all energy and fuel risks remained socialized,
is a good example of a poor country with little or no market leverage trying to structure an arrangement within which privatization could occur, without an adequate framework. One could well argue that such compromises between policy-making and economic imperatives are natural and justifiable in view of the circumstances, but inherent in that argument is the assumption that the benefits of privatization outweigh other considerations. While that may or may not be true in given circumstances, there is a troubling paradox, which is that for privatization to succeed, a proper framework needs to be established, but in order to privatize, many key elements of that framework will need to be put aside. Overcoming this paradox will doubtlessly lead many otherwise intelligent public officials to conclude that the easier course is to privatize and worry about the details later.

A sixth explanation derives directly from this paradox. Outsiders often regard the time and labour to get the framework 'right' as procrastination, or perhaps even view it as passive resistance to privatization. These are certainly opinions that one hears at the IMF and the World Bank and sometimes they are even true. But not always! Giving serious consideration to all of the options and balancing of the interests to be served is indeed a complicated, time-consuming business. It is easy to confuse the process with obfuscation and delay. It is also easy to run roughshod over serious matters deserving of further contemplation in an effort to overcome passive resistance to privatization. Thus conscientious officials who undertake such contemplation find their motives questioned and they themselves are accused of blocking progress. Many so-called restructurings in eastern Europe, particularly in the former Soviet Union, bear witness to the failure of lenders and donors to distinguish between procrastinators and thoughtful policy-making. In many cases, locals with relevant expertise were excluded from all activities except actual implementation. It is not at all surprising that serious, often essential, efforts to establish an appropriate framework are given so little attention.

A seventh explanation derives from the ideological/stereotypical assumptions described above. When policy makers simply assume that privatization is such a significant step forward, they may devote scant attention to structuring the market, articulating social expectations, and developing the regulatory/legal framework within which the sector will operate. Often, these are viewed by privatization ideologues as impediments to market functioning, and the ability to attract capital. If providing a means for continued state intervention in the sector is important, sometimes a conscious ideological decision is made to avoid articulating the context of privatization prior to its
implementation. In other cases, the ideological view is so pronounced that the framework issues are simply never discussed. In Brazil, for example, state-owned enterprises were prohibited from retaining expert advisers on privatizing and restructuring for fear that the government’s prevailing ideological view would be challenged. For the same reason, restructuring in the electricity sector in Ukraine was largely a regime imposed by a consortium of foreign lenders and donors, who sought and received little input from Ukrainians in the sector, lest they only offer a traditional, socialist perspective.

An eighth possible explanation, while not necessarily the least likely, is clearly the least palatable. That explanation, of course, is that decisions can be motivated by corruption. Obviously, transactions that are not fully subject to some external discipline are more likely to be suspect than deals consummated under more ethical and transparent conditions. The absence of any significant market or regulatory framework, of course, while not causing corruption, certainly can facilitate it. A decision-maker who wants to take untoward advantage of his/her position will almost certainly try to conduct business in circumstances that are free of external constraints. Similarly, an investor who seeks to use corrupt means to make a favourable deal may lobby very strongly to finalize a deal before an external framework can be imposed.

A final explanation for a poor decision-making sequence is that the fundamental debate within most countries is whether a particular industry should or should not be privatized, and not about how best to do so. Having prevailed in their argument, privatization’s advocates often feel compelled to move quickly before opposition resurfaces. They may confuse discussion of the framework for privatizing with opposition to privatization itself, and therefore press ahead without paying adequate attention to the details that will determine the outcome of their endeavours. In some cases, the haste to move ahead and avoid additional complications has actually led to the total or partial exclusion of personnel in the sector to be privatized from any discussion of the framework within which the industry will operate post-privatization. The result is uncertainty, and the lack of common understanding about the regulatory regime, market rules, social expectations, or other critical matters.

Regardless of the reasons, an inadequate framework often creates barriers to the attainment of many of privatization’s objectives. How privatization occurs is frequently a predictor of its success. It is useful to look at some of the critical objectives and to examine how the failure to get the framework right can subvert the entire effort.
The goals of privatization and the consequences of an inadequate framework

Optimally, the change from state ownership to private control is not the only transition that occurs: there are two others. The first is the encouragement of competition where it has never existed. Because private enterprises best function when there is a robustly competitive market, infrastructure industries with core, bottleneck functions do not always achieve full competition. Nonetheless, it is important that competitive markets be encouraged where viable, and that the bottleneck functions be adequately regulated to assure quality service and to avoid the extraction of monopoly rents.

The second change is moving from a mentality where both risk and reward are socialized to a mentality that allocates risks and rewards between the private and public sectors in a rational, equitable, and symmetrical manner. Privatization of gains with socialization of risks is a nice fantasy for private investors. Similarly, some consumers may fantasize about socializing gains while privatizing risks. Neither regime, of course, is workable. Nonetheless, both subtle and direct pressures will exist to move towards one of those regimes. Such pressures can only be successfully resisted when privatization is accompanied by a mindset that recognizes that private investors should be required to assume a level of risk commensurate with potential gains. The risk to investors can be divided into three categories: (1) fully controllable (e.g., construction, management, prudence); (2) partly controllable (e.g., cost of capital, cost and availability of critical resources such as fuel); and (3) completely uncontrollable (e.g., changes in environmental requirements, taxes, currency fluctuation, and inflation). The risk must be allocated efficiently, and this is best done by understanding how controllable the risk is by those to whom it is assigned, who benefits if the risk does not materialize, and how to replicate risk allocation in a fully competitive market. In summary, privatization can only be effective where risk and reward are allocated appropriately, and where a market mentality governs.

Determining where markets can and cannot flourish is not a trivial exercise. Market forces must be allowed to govern where they are viable, but relying on them in the absence of competition is hazardous. Private companies are almost by definition profit maximizers. There is nothing wrong with the desire to maximize profits, as long as the ability to maximize profits is disciplined by either competition or regulation. Ideally, either discipline will provide incentives that link profit to performance. The absence of discipline, however, can lead to exploitation of consumers who purchase services from providers that
charge high prices and who lack any particular incentive to be efficient. While the need for external discipline seems obvious, it is for reasons already noted, not always put in place. Even where the need is recognized, it can be difficult to establish and deploy competition or regulation.

When is a market competitive? Is it when new entrants are theoretically allowed to contest a market, or do new entrants actually have to pose a viable threat to incumbents before the market can be deemed competitive? The degree to which markets are competitive often determines the nature of the regulatory regime. Regulation ranges from cost of service to price caps, revenue caps, anti-trust (enforcing competition), or even handicapping market-dominant players. There are also many legal/policy frameworks which might be established, such as licence-based (contract-based) regulation and rule-based (regulatory body discretion) regulation. Improper or wrongly applied regulation can impede competition. Inappropriate regulation can have the effect of removing an essential discipline. A detailed discussion of economic analysis and an examination of the options are beyond the scope of this paper. The point, however, is that one cannot conclude that privatization by itself puts market forces to work. Sorting out where competition will work and the form of regulation that needs to be applied is an exercise critical to privatization’s success.

To illustrate the importance of getting the framework right to achieve the objectives sought, the following three examples are worth contemplation.

**Improved productivity**

Privatization, in and of itself, does not produce greater productivity. There is no reason to believe that unregulated, private monopolies, for example, will perform any better for society than a state-owned monopoly. Moreover, even where there are productivity gains, there is no assurance that any of the benefits will accrue to consumers or to the economy as a whole. Private, for-profit companies naturally respond to incentives. Indeed, one of the attractions of privatization is that unlike the public sector, it is possible to construct meaningful incentives. It is critical, however, to create incentives that align the interests of both investors and consumers. Incentives for productivity gains that benefit investor and society alike are inherent in a viably competitive market. Where the market is not fully competitive, however, the regulatory regime must set the appropriate incentives.

Perhaps the classic example of inappropriately established incentives is in the privatization of Rio Light, the electric distribution

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company of Rio de Janeiro, Brazil. After a competitive solicitation, the company was sold to a Franco/American consortium of EDF (Electricité de France), AES Corporation, and Reliant. The incentive structure in the licence agreement is noteworthy. The tariff was a seven-year price cap with RPI. There was no X factor employed. The publicly stated rationale (although enticing investors was probably the real one) for not indicating an expected level of productivity gain was that by allowing the investor to retain all productivity gains, it maximized the incentive to improve efficiency and did not confiscate the profits earned through such gains. The problem with this formulation is that it fails to distinguish between productivity gains and mere cost-cutting. By not building in at least a minimum productivity expectation, the incentive was merely to cut costs. That incentive was, in effect, magnified by the absence of either performance standards or regulatory oversight. The private owners followed the incentives perfectly. They reduced the number of employees, slashed other costs, and made very little investment in a system that had already deteriorated because of capital starvation under state ownership. About a year after privatization, when the system was under severe strain due to an extended heat wave, it simply collapsed. The personnel who were skilled at maintaining the system on a virtual shoestring under state ownership had largely exited the company because of the cost-cutting exercise in force. The combination of equipment failure and absence of skilled personnel led to a sustained outage that angered the city’s consumers. ANEEL (Agencia Nacional de Energia Electrica), the regulatory agency that had literally only come into existence one week before the outage, was left to cope with skewed incentives that were contractually protected for seven years, no performance standards to evaluate performance, and questionable legal authority to oversee licence conditions that were promulgated prior to the creation of the agency. While one can fault the management’s shortsightedness, the fact is that it followed the incentives it was given. Privatizing in a severely flawed and ill-conceived restructuring framework produced worse performance than had existed under state ownership.

Contrast the situation in Rio de Janeiro with the experience in Argentina’s electricity sector where the entire generating sector was unbundled and privatized into 38 different companies. A competitive market and regulatory structure were put in place contemporaneous with privatization. Like Rio Light in Brazil, the Argentinian plants

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4 It is curious that the transaction is described as privatization at all. A consortium led by a state-owned company borrowed money from a state-owned bank to buy another state-owned company.
had been inadequately maintained under state ownership. New investors had to make substantial investments in the plants in order to compete with the other generators. As a result, the productivity of the sector improved dramatically. A well-designed market and incentives produced positive results for all concerned.

**Reduced political and social interference**

One of the most common justifications for privatizing infrastructure is to remove politics from a sector. It is an article of faith, for example, that state-owned companies suffer from political interference and, therefore, can never operate on a fully commercial basis. While that may not be universally true, there are certainly enough stories about artificial job creation, diversion of needed resources, manipulation of tariffs, and a variety of other abuses to indicate that there is a great deal of truth to the belief. It is naïve, however, to believe that privatization alone will change that. In fact, it is absurd to think that a private investor will sink a large amount of capital into an enterprise and then unilaterally disarm himself politically. Obviously, investors will use all legal means, including political, to protect their interests. Similarly, it is unreal to expect that social expectations will terminate or diminish merely because assets have been transferred to private ownership. It seems obvious that investors will seek to manipulate a system to their benefit, and equally obvious that politicians, interest groups, advocacy organizations, and others will continue to push for their own objectives. As long as the means used are both legal and ethical, this is a perfectly acceptable process. However, even when assuming strict adherence to law and ethics, there is reason to believe that political influence on hiring, service priorities, revenue and resource allocations will still be an inherent part of the horse trading that will invariably result. Left unchecked, there is every reason to believe that some political manipulation, although different in kind, will continue in a privatized regime.

The key to avoiding undue politicization is found not in privatization, but in the development of a proper framework. To deter improper political interference, the framework must define the scope and nature of permissible government intervention in the sector, must clearly articulate the economic and non-economic expectations to be served, must define the acceptable limits of lobbying behaviour, and must require public agencies to conduct business in a transparent manner. It must assign as many critical decisions as are warranted by the existence of competition to the marketplace, which must also function transparently.
On a related note, an oft-stated reason to privatize is that it will reduce opportunities for corruption. This also seems naïve. Because infrastructure industries inherently require vast amounts of money to build and operate, only the most convinced privatization ideologue would try to argue that privatization removes opportunities for corruption. When a high-level official in an African nation, which had liberalized its economy and privatized some of its infrastructure, was asked if privatization had reduced corruption, he responded that while corruption was no less prevalent, the appearance of private capital had raised the price of influencing public officials. As this comment demonstrates, the antidotes for corruption do not inherently arise from privatization. Instead they arise from creating an environment within which viable market forces reduce the need for government intervention, and business is conducted transparently, adopting and enforcing rules governing ethical behaviour. These antidotes are derived entirely from the framework and discipline within which privatization occurs.

**Sustainability of the new regime**

The cycle of nationalization and privatization is a long one in much of the world. One of the goals of the contemporary trend in favour of privatization is to stop the pendulum from swinging back again. Obviously, getting the restructuring framework right and the continuing ability to tweak the system when circumstances so require are crucial. Nevertheless, many countries find themselves in positions that require them to write long-term licences that have the legal effect of binding the government and regulators for extended periods. Investors look for the certainty that such long-term arrangements provide. Ironically, obtaining that certainty may produce significant instability in the arrangements. The best example occurred in England and Wales. In the initial licences granted to the electricity distributors, the regulator, in his proposed calculations, severely underestimated the productivity gains that were available. As a result, the five-year, annual X factor in the RPI-X formula was substantially less than what might have been warranted under the circumstances. When the subsequent high profits earned by the distributors were revealed, consumers voiced their displeasure. Two things occurred in response to the hue and cry. The regulator changed his X factor calculations to reflect a higher level of expected productivity gains than had earlier been announced, and the Labor Party, after promising to do so during its election campaign, enacted a windfall profits tax that took back some of the profits. The system held in the United
Kingdom, but one wonders about the financial market's reaction towards a developing country that takes similar measures. The larger point, however, is that the sustainability of a privatization framework may well depend upon building in tolerable levels of uncertainty.

A privatization scheme will be sustainable only when it has been carried out in a framework of transparent transactions disciplined either by competition or by independent regulatory oversight. Enron's Dabhol Plant in India is a prime example. The contract negotiated between Enron and the MSEB (Maharashtra State Electricity Board) was the result of private, non-transparent, negotiations outside of any competitive or regulatory regime. The MSEB signed the contract under considerable political pressure from New Delhi and beyond, despite widespread opposition by technocrats and multilateral lenders. When the opposition party campaigned in Maharashtra's next election, it struck a popular chord when it promised to reneg on or renegotiate the contract. Once in power, the government did force a re-negotiation, but when the new terms proved uneconomic, the MSEB simply stopped making payments, and the central government has not honoured the sovereign guarantee it had provided. While the outcome of Dabhol is not yet clear, the lesson is. For a transaction to be credible and sustainable, it must occur within an acceptable restructuring framework. In the absence of transparency, and both competition and regulatory scrutiny, privatization is unlikely to be sustained during difficult times. As mentioned earlier, situations similar to Dabhol have occurred in Indonesia and Pakistan, and these 'privatizations' are just as unsustainable as in India.

**Conclusion**

The focus of infrastructure reform must be on the restructuring framework, not just on privatization. Privatization may be a perfectly reasonable means to achieve the objectives of restructuring and reform in many circumstances. It is not, however, universally applicable in the absence of a suitable framework, and it is likely to be a most unsuitable instrument for reform. Those who undertake privatization in developing countries must learn to distinguish between the ends of sector reform and the means of privatization.

**Acknowledgement**

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Interestingly, the stock prices of the electric distributors remained relatively unaffected by the change in calculations.
The European Union's social dimension: from market to welfare?
The emergence and expansion of the social dimension in European Union policy-making

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Abstract
This paper outlines the development of social policy-making in the EU (European Union). It argues that contrary to the prognoses and judgements of many observers, the social dimension is rapidly emerging as a key factor in EU policy-making and governance. In some policy areas, the development entails reinforcement and elaboration of earlier policy considerations, for instance, in the area of occupational safety and work environment. Other policy developments – in the areas of employment, public health, food, anti-discrimination, gender equality, and fundamental rights – are largely recent, having emerged in the 1980s, and give an entirely new profile to EU policy-making and governance.

The paper also argues that 'soft laws' and 'non-legislative measures' characterize some of the most significant developments in the general area of social policy. This is largely due to the requirement under EU rules that unanimity is necessary for legislation addressing social issues. However, even 'hard' social laws have been established in policy areas where the issue can be framed in terms of single market considerations. The theoretical approach in the paper builds on the new institutionalism. Institutional analysis is combined with cultural analyses, e.g. the role of framing, definitions of reality, and conceptualizations of problems and solutions. The concepts of public policy paradigm – and paradigm shifts – are introduced and applied to the transformations taking place in EU policy-making and governance.
when the institutionalized core principles that have guided policy are replaced with the incommensurable core principles of a new paradigm. This does not necessarily imply the removal of the former principles. It is rather a reordering of principles and priorities in ways that lead policy-making in fundamentally different directions and evaluate success or failure by very different kinds of indicators. The findings of our research suggest that deepening institutionalization of reordered policy priorities – or paradigm shifts – which have taken place in several EU policy sectors are contributing significantly to expanding the importance of social issues in EU policy-making. Equally significant is the finding that the overall effect of these shifts appears to come at the expense of the neo-liberal market paradigm that has influenced much of EU policy-making over the last quarter of the 20th century.

Institutionalization of the social dimension in European Union policy sectors

Some social concerns have long been institutionalized in the language of the EU treaties and law. The principle of equal pay for women was included in the Treaty of Rome (1958),\(^1\) while concerns for worker health and safety were incorporated in the Euratom Treaty (1958).\(^2\) A lack of results on the issue of equal pay generated a trio of Directives in the latter half of the 1970s in an effort to give necessary form and force to the principle of gender equality.

The first of these Directives characterized the principle of equal treatment as an economic issue, describing the goal of equal pay as ‘an integral part of the establishment and functioning of the common market’ (Directive 75/117/EEC: Article 1).\(^3\) Legislation concerned with occupational health and safety also found its way into the acquis communitaire during this period, with Directives establishing some limits on workers’ exposure to carcinogenic substances (see section titled Occupational safety and work environment). Critics have argued that, in practice, these early expressions were either largely symbolic, representing an EU codification of regulations that already existed in the laws of most member states, or were primarily an adjunct to achieving the common market (Rossilli 2000; Kenis 1991).

\(^1\) Description available at <http://www.europarl.eu.int/factsheets/4_1_1_en.htm> last accessed on 10 December 2001.
instance, Directive 90/394/EEC\(^7\) protected workers handling substances and preparations responsible for increased risks of cancer and was amended in 1997 to specify occupational limit values for known carcinogens. The recent Directive 97/65/EC\(^8\) protects workers from risks related to exposure of BSE (bovine spongiform encephalopathy) and TSE (transmissible spongiform encephalopathy) agents at work.

In connection with these numerous directives, recommendations, reports, and study programmes, new institutional arrangements have been established regularly. The Advisory Committee on Safety, Hygiene, and Health Protection at Work (1974) is responsible for assisting the EU Commission in preparing and implementing actions in this area and in facilitating cooperation between national administration, trade unions, and employers' organizations. The Dublin Foundation for Living and Working Conditions (1975) was established to contribute to the planning and development of better living and working conditions. The European Agency for Safety and Health at Work (1994), also known as the Bilbao Agency, was established to create a common knowledge base regarding work environment in the member countries. Numerous labour inspectors have been designated to check on and encourage the effective enforcement of prescribed standards in workplaces. Also, the EU has established the Senior Labour Inspectors Committee (1995) to exchange technical information and experience. This committee initiates discussion forums devoted to inspection practices, priorities, and methods as well as risk assessment, and is currently also conducting dialogues with applicant countries.

**Public health and food safety issues**

The emergence of EU policy discussions and directives is evident in many areas—blood alcohol levels of drivers, orphan drugs, drug monopolies and pricing, etc. Food is a particularly important issue. The EU food policy has, until recently, fallen largely within the realm of single-market and agricultural policies. Important health and safety considerations emerged on the EU agenda in response to repeated crises and through actors, who emphasized the public health

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gled for such rights while also arguing that ‘rights’ without judicial recourse are meaningless since they can be readily denied.

Another component in EU policy concerns balanced participation of women and men in policy-making; workers’ rights, including freedom from gender discrimination; and safe working conditions associated with public health. Significant developments include the emergence of issues such as domestic violence, trafficking in human beings, and sexual exploitation of children and child pornography.

Benhabib (1992) has characterized the struggle for justice as a struggle to move an issue from the private to the public sphere. This is apt in the cases of both gender equality and workers’ rights, where the recent ‘Europeanization’ has entailed the shifting of authority from an essentially private or national public sphere to a European public sphere. In the case of domestic violence, the shift is from the private sphere of a family, with the state often looking the other way, to a public sphere. Similarly, in the case of non-discrimination and equal opportunity, the focus shifts from the semi-private sphere of employment. In the case of balanced gender participation in policy-making, the national public sphere of subsidiarity and national sovereignty is replaced by the European sphere. The European trade union movement has long contemplated social goals for the EU (Westerlund 1995), but it is only recently that explicit treaty language, goals, recommendations, and legislation have begun to reflect these in a substantial manner.

**Extending democracy and opposing discrimination and xenophobia**

Documents in the EU suggest an increasing awareness that the socio-political engagement of citizens is essential to building a sense of ownership and membership in a united Europe. Stinging criticisms regarding the EU’s ‘democratic deficit’ (Andersen and Eliassen 1996; Andersen and Burns 1996) have helped generate discussions about the lack of opportunities for effective political participation. There are currently a number of investigations, deliberations, and policy preparations concerning the EU democracy. Perhaps the most visible of these is the EU Commission’s determination to produce a White Paper on European Governance (EC 2001).

Simultaneously, there has been a sustained realization of problems of discrimination that impede the participation of individuals and groups in work, politics, and daily social life. Article 6\(^{10}\) of the Treaty

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European-level problems that are defined as requiring supranational solutions.

**Theoretical approach: the new institutionalism**

Two of the dominant perspectives applied to the analysis of EU governance and policy-making are the intergovernmental approach (e.g. Moravcsik 1998) and the neo-functional approach (e.g. Sweet and Sandholtz 1998). The intergovernmental (or ‘realist’) approach assumes that the outcome of the EU’s political deliberations are a function of member states’ preferences and that these are, for the most part, fixed. Empirical research has repeatedly suggested, however, that member states’ preferences are instead unstable and shift over time (Nylander 2001; Sandholtz 1998). The neo-functional approach argues that Europeanization – the transfer of political authority from member states to the EU level – is a result of the needs generated by increased transnational activity. Therefore, in sectors where industries have a high level of transnational activity – cross-border exchanges and transactions, multinational ownership, etc. – policy-making and regulatory authority are likely to be transferred to the EU level. Although it is true that industrial sectors with a high number of international transactions are more Europeanized than others, empirical research indicates that this cannot fully explain Europeanization (Nylander 2001).

Our previous research, building on the new institutionalism (Burns 1999; Burns and Flam 1987; March and Olsen 1989; Powell and DiMaggio 1991; Scott 1995; Thomas et al. 1987, among others), suggests another perspective to understand and explain policy development in the EU (Andersen 2001; Burns and Nylander 2001; Burns, Carson, and Nylander 2000; Carson, Nylander, and Burns 2001). The approach stresses the role of culture and explains how conceptualizations of both governance and specific policy questions guide action and become institutionalized. It focuses attention on the ways in which public issues and problems are framed and defined and solutions proposed within a particular, culturally-defined, conceptual framework. Borrowing from Hall (1992), we refer to such a framework as a public policy paradigm.

A policy paradigm has its own particular rules, internal logic, and underlying values and assumptions. It prioritizes specific institutional principles and goals (pertaining to state, market, civil society, or family), identifies and frames social problems, and defines whether issues should be addressed by action in the public sphere or the private, and how they should be analysed and dealt with. The interplay of the sometimes complimentary, sometimes competitive, and some-
digms, new programmes, and institutional reforms. It considers contradictory perspectives among agents, their conflicts, and negotiations that may or may not ultimately lead to significant policy changes. While some actors may argue the need for new policy priorities, others seek to maintain the status quo and use their persuasive, political, or other powers to resist policy initiatives. Hence, in contrast to the neo-functional perspective, a cultural-institutional approach recognizes and takes into account the fact that there are social agents that engage in distinct conceptual and political struggles in relation to EU governance and policy-making (Burns and Nylander 2001). In the context of such struggles and power conditions, ‘functional’ arrangements need not prevail, at least not in the short run. Institutional arrangements and/or public policies may be largely dysfunctional or suboptimal over extended periods of time.

In contrast to intergovernmentalism, a cultural-institutional approach does not limit itself to government agents and national/intergovernmental processes. Neither does it ignore policy-relevant processes not typically associated with intergovernmental processes. However, the formation of opinion, preferences, and policy initiatives may take place outside the context of intergovernmental relationships and their impact on EU policy processes.

In general, key questions about EU policy processes can be investigated and explained in terms of the interplay of actors, institutional arrangements, and cultural factors (the latter are defined for our purposes as the way in which the world and its various aspects are perceived and understood, specifically through a given policy paradigm). The focus is then on the concrete agents involved, their value commitments and beliefs, the resources available to them, the institutional pathways and arenas where they exercise influence, and their typical strategies. Single, overlapping, or competing paradigms are manifested in particular strategies, discourses, and policy initiatives (and counter-initiatives) and ultimately the decisions taken, or not taken, as the case may be.

Initial findings and propositions

Our sector-oriented research on EU policy-making has investigated key developments in a number of sectors. These are energy, including electricity and renewables; pharmaceuticals and bio-technologies; alcohol; food safety; occupational safety and work environment, and public health (Carson 2001a; Carson 2001b; Nylander 2001; Nylander 2000; Nylander, Carson, Burns 2001; Sutton and Nylander 1999). In these areas, we have collected and analysed available documents, conducted interviews, and drawn on the special
problems were considered in some cases as entailing unacceptable costs on social or health grounds. In some cases, they were even seen as a potential threat to the entire EU economic undertaking. Such policy issues and initiatives are problem-driven. Examples are the food crises of the 1990s and the dangers to health and environment posed by asbestos and dangerous chemicals.\textsuperscript{14}

The major pattern here is that EU economic policies and market mechanisms result (or are anticipated to result) in serious public problems, including food security problems and the reduction of workers' living standards or work environment standards. Therefore, social policies are initiated to address problems at the EU level. In several cases, they have led to what we have defined as a shift in public policy orientations and paradigms. For instance, the food crises of the 1990s led to a shift in the policy paradigm for food policy from what was largely a commodity and market perspective to a perspective which gives first priority to public health considerations and directs these to be upheld or realized through a new EU food agency.

The pattern is similar in the case of chemicals. Chemicals policy until recently was largely concerned with market values and competitiveness. It appears that ‘sustainability’, environment, and public health concerns are now (2001) being set out as top priorities, enabling major policy shifts. This process was facilitated by the EU’s effort to ban asbestos, which is dealt with as part of the broader chemicals policy. One aspect of this new policy paradigm is a shift of ‘burden of proof’ concerning possible negative consequences. Under the new approach outlined in the recent White Paper on Chemicals Policy (COM (2001) 88 final),\textsuperscript{15} the beneficiaries of chemical products, including above all the producers, must provide evidence of their products’ safety retroactively. This stands in marked contrast to the earlier rule that the potential victims, public officials, and public interest groups had to provide definitive evidence of harmful effects for a product to be substantially restricted or withdrawn from the market.

A number of social issues neither linked to market considerations nor ‘addressable’ in these terms have, nonetheless, become EU concerns and policy matters. For instance, issues of ‘human rights’, domestic violence, and racism and xenophobia are matters of general concern and widespread consensus among the

\textsuperscript{14}Non-market areas where policy developments have been problem-driven are, for instance, the emergence of radical nationalist movements in the 1980s; and evidence of systematic institutional discrimination of minorities and immigrants.

were not available earlier to those interested in public health matters. This is one of the ways an effective public paradigm shift is brought about.

New forms of policy-making and governance have been developed, especially in the context of social policy issues that cannot - either conceptually or in terms of support from powerful actors – be handled in market and competition policy areas requiring only qualified majorities. Nonetheless, important EU agents consider that certain social problems should or must be dealt with and are determined to do so. Consequently, new methods of policy-making and governance are developed. Initiatives in ‘social’ policy areas that require member state unanimity led ultimately to the development of ‘soft laws’ and non-legislative measures such as data gathering, dialogue conferences, standardization of classification and measurement, opinion formation, and education.

Social policy formation and the logic of governance tend to differ substantially in arenas where, on one hand, social policies are linked to ‘competition’ and ‘market’ issues and the rule of a qualified majority applies and, on the other hand, those which are not linked in such a way can only be settled through consensus. The following pattern emerges. Policy areas defined in relation to ‘market’ and ‘competition’ tend to exhibit ‘hard’ regulation and enforcement; directives are meant to have teeth. Initiatives in areas requiring unanimity (and typically understood as ‘social’) have become closely associated with the development of “soft laws” (Jacobson and Johansson 2001) and non-legislative measures (Burns and Nylander 2001). ‘Soft law’ in the EU context refers to rules, agreements, and policy statements that are not legally binding but which can be said to have some legal content and are intended to influence member state policies, as in the case of recommendations, codes of conduct, and best practices (Jacobsson and Johansson 2001). Non-legislative methods overlap with ‘soft laws’ but they need not have any legal-like character, for example, collecting and sharing standardized and comparable data among member states; making international comparisons, and applying peer pressures (including benchmarking) to align policy.

Establishing a problem, issue, or policy area as ‘European’ is among the principle strategies of EU actors including, of course, the Commission (Burns and Nylander 2001). We see this in operation in the current attempts to establish public health policies. One constructs European public health issues that can only be resolved – or at least resolved best – through EU policy. The Commission tries to identify political issues and objects for action that are distinct from those found at national levels (Sutton and Nylander 1999). This is
Alcoweb, with a standardized methodology. Such information can be used in arguments to justify action since it provides evidence of a global phenomenon that the EU can justifiably address and use to develop unique practical competencies.

Elsewhere, we have identified the strategy of the EU Commission to shape and manage networks, both in creating interests and mobilizing a constituency of support (Burns and Nylander 2001). One basis of the legitimacy of EU policy, given the norm of consensus, derives from the broad engagement and participation of a variety of relevant interests (Andersen and Burns 1996). New interests and lobbyists continue to appear on the scene. Recently, following the Maastricht Treaty (1992), 16 non-governmental organizations have become increasingly active in the area of public health. Eurocare, for example, was established in 1995. The Commission, too, has often taken initiatives by lending financial and other forms of support (Greenwood 1997). The European Public Health Alliance has received 75% of its funding from the Directorate-General for Employment, Industrial Relations, and Social Affairs, in lieu of which, it is expected to provide a range of services to the Commission, other public health interest groups, and the general public. Concerning alcohol, a report by Eurocare on Alcohol Problems in the Family received sponsorship by the Commission, and was launched at a press conference (Sutton and Nylander 1999).

Other non-legislative forms of coordination and common policy development include conducting EU workshops and conferences to discuss and analyse policy issues and measures; sharing experiences from similar or different approaches; defining a policy issue as ‘European’; identifying ‘best practices’; etc. Such practices contribute to establishing ‘a common European approach’ for defining problems, establishing goals, and formulating solutions. The distinction (and competition) between this emerging social paradigm and the American approach also promotes awareness of, and commitment to, a unified European paradigm, adding a powerful force for collective problem-solving and mobilization.

In sum, the methods outlined above put a stress on framing, opinion formation, European data collection, standardization of measurements and classification, monitoring, mutual learning processes, and the diffusion of ‘best practices’, among others. Social policies handled in this way differ somewhat in character from those that are handled or can be handled in the more conventional ways, that is,

is required, policy-making may be advanced quickly and systematically, as is the case with market integration issues and even social issues that are closely tied to market considerations. Social policy areas where unanimity is required lag behind unless there is high consensus, as appears to be the case with human rights. Some social and health policy areas have been more contentious and problematic as exemplified by alcohol policy-making (Sutton and Nylander 1999).

Discussion and the future
Table 1 presents a summary of policy developments that indicate the substantial development of selected EU areas over the past 15 years. Several of the developments have been discussed in the previous section. Occupational safety and health have been of concern since the earliest treaties, the European Steel and Coal Community Treaty or the Treaty of Paris (1952) and the Treaty of Rome (1958). Within this framework, the concept of equal treatment of women and men was also formulated. Gender eventually became a more general issue concerning such matters as domestic violence and women’s role in the EU, and was ‘mainstreamed’ by 1999. The gender dimension was to be considered in all EU policies. ‘New’ areas such as chemicals and food were policy matters earlier but from an entirely different perspective, emphasizing mainly the uniformity of products in terms of compatibility with the internal market. By the 1990s, however, health and security had become major issues. Human rights, anti-discrimination, and racism also became important concerns during the 1990s for the European context (rather than South African, American, or Latin American contexts).

The table is intended as a qualitative indication of social policy developments over time. Other policy areas (educational policy, Internet policy, genetic technique and manipulation, etc.) could have been included and would illustrate similar trends and patterns. We also want to point out that another significant development, not presented in Table 1, has been the formulation in treaties of the authority or ‘competence’ of the EU to move into social policy areas. The overall process is a complex and dialectical one. There is no linear process of the EU simply taking action after legal competence is formalized in the Treaties. Rather, there is an ongoing process in which framing policy, taking action, and establishing formal authority feed into one another with specific constraining and/or reinforcing effects. The example of gender equality is useful for illustrating these factors. The principle was first introduced in the Treaty of Rome in an article setting out the principle of equal pay for equal work. A lack of progress on this matter led in the mid-1970s to a series of Directives based on
<table>
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<th>Key Policy Statements and Preparations</th>
<th>EU Actions</th>
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<td><strong>Chemicals policy</strong></td>
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<td>1967</td>
<td>First legislation on labelling and packaging requirements for hazardous chemical products.</td>
<td>1976</td>
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<td>-</td>
<td>1967</td>
<td>First legislation on labelling and packaging requirements for hazardous chemical products.</td>
<td>1980</td>
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<td>-</td>
<td>1981</td>
<td>EU establishes prior approval for marketing of new chemical products.</td>
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<td>-</td>
<td>1991</td>
<td>The Commission announces intention to seek ban on asbestos.</td>
<td>1999</td>
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<td>-</td>
<td>1991</td>
<td>Regulatory emphasis on asbestos shifts from control of a few specific hazards to ban with limited exceptions.</td>
<td>2001</td>
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<td><strong>Public health and food safety</strong></td>
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<td>-</td>
<td>1962</td>
<td>First Food Directive regulating the use of food dyes.</td>
<td>1975-1989</td>
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<td>-</td>
<td>1995</td>
<td>DG (Directorate-General) XXIV on Consumer Policy and Consumer Health Protection established</td>
<td>1996</td>
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<td>-</td>
<td>1999</td>
<td>Emergency measures adopted to ban export of Belgian poultry products in response to dioxin contamination</td>
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<td>2002</td>
<td>Establishment of European Food Authority anticipated</td>
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1 Green Papers, White Papers, Work Plans, and Major Reports
2 Legislation, new organizational structures, programmes, or institutional arrangements
the principle of equal pay. Unfortunately, concrete action lagged once again until the mid 1990s, when the Commission developed the strategy of ‘gender mainstreaming’. However, it was not until the implementation of the Amsterdam Treaty that the strategy was formalized. This strategy developed in conjunction with a redefinition of women’s rights.

The increased prioritization of interrelated ‘social principles’ in the EU’s institutional structure is connected with policy areas such as health and welfare, work environment, gender equality, and racial discrimination. The aim of our research has been to determine and explain the extent to which there is an overall secular development towards a ‘European Welfare Paradigm’. While much of this research is focused on particular policy developments in a number of sectors, there is evidence of a secular trend of the extension and elaboration of the social dimension in the EU across diverse sectors. If contemporary research confirms this, how is this to be explained? It appears that it might be more the result of uncoordinated or ‘spontaneous’ initiatives to address concrete problems (since there is limited evidence of a sustained central leadership in the EU pushing the development), although the Jacque Delors programme (1985–94) at the Commission formulated the Social Charter (1989) among other things (including the Single European Act in 1986). It stressed that the EU should systematically address social issues such as exclusion and employment. The Lisbon Summit of Ministers (2000) also emphasized these concerns as priorities. One of our working hypotheses is that these diverse initiatives are motivated, and give expression to, by deeply held core values, understandings, and ideas in Europe (Andersen 2001b). These relate to matters like human rights, democracy, rationality, cultural diversity, family security, social security. Another view is that at least some attention to social issues was a prerequisite for the successful passage and continuation of single market initiatives (Kenis 1991).

The secular trend towards a more social Europe has not been a linear one. During the 1980s and early 1990s, a neo-liberal paradigm with associated discourses and policy initiatives stressing markets,
Our current research seeks to systematically specify and analyse the public policy paradigms guiding policy-making in the EU, along with their interrelated discourses. On a theoretical level, we seek to further elucidate the various mechanisms by which a new paradigm formation emerges and competes with established policy paradigms that define social reality and ways of dealing with it. In the process, we continue to map out and clarify the ongoing evolution of the EU experiment—its government arrangements (Burns and Nylander 2001) and its social policy developments (Carson 2001; Nylander 2000).

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The water crisis in India: need for a balanced management approach

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Abstract
The three challenges of a supply-side solution to the water crisis in India are (1) creating new potential for enhancing supply, (2) achieving equitable distribution, and (3) meeting the needs of sustainable development. These need to be handled concurrently and are becoming increasingly unattainable. The demand-side solution also presents three challenges: (1) creating new technologies for reducing water demand (2) bringing about changes in the societal mindset about water usage, and (3) initiating and enforcing water-related structural reforms. Though earlier considered complex, the demand-side solution now appears softer and attainable as compared to supply enhancement options now available. The paper advocates a paradigm shift in India’s approach to the water resource problem, focusing on water management as a balanced approach. Also, it lists out the key initiatives and the institutional and regulatory reforms needed for bringing about the desired shift.

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Water crisis

Water-related problems in India have reached a crisis point and given rise to issues of widespread drought, depleting groundwater levels, salinity, and increasing pollution of water bodies. All these issues relate to an imbalance in demand and supply.

The situation of a gap between the demand and supply of usable water is of grave concern, having given rise to a division of people into the ‘haves’ and ‘have-nots’ in terms of their access to quality water. Apart from drawing geographical demarcations, the water crisis has sharpened the dividing line between the urban and the rural, the rich and the poor. The media reports – about starvation deaths, increasing cases of suicide among farmers, mothers selling off their babies, and the rising graph of criminal activities in rural areas – are not too distant to be forgotten. They all relate to the plight of rural poor faced with the situation of unsustainable yield from farmland, due to paucity of water. Scarcity of water has also affected the performance of several industries, including power plants. Besides the social and economic angle, the present water situation has political, legal, environmental, and even religious connotations.\(^1\)

The reasons for the water crisis in India are (1) the ever-burgeoning population (currently 16.5% of the world’s population) while India’s share of water resources (at roughly 4%) is very small, and (2) the rise in the per capita consumption of water.\(^2\) The ever-increasing imbalance in the demand and supply position of water forms the core structural aspect of water crisis, solution for which is sought by enhancing supply potential. Reducing the imbalance in demand and supply by managing the demand has not been encouraged so far even though it is a viable alternative for solving water crisis. The absence of a national water vision, lack of centralized planning, inadequacy of water usage laws and the intolerance of stakeholders of water resources development projects towards one another are all non-structural aspects of the water crisis.

Water supply and demand scenario

The annual precipitation of India is about 4000 km\(^3\). A significant portion of rainfall returns to the atmosphere by evaporation, a large

\(^1\)Examples: Inter-state water disputes (political manifestation), Sardar Sarovar Project (judicial intervention), anti-dam agitation (environmental concerns), objections to Tehri Dam on Holy River Ganga (religious sentiments).

\(^2\)A study by the National Commission for Integrated Water Resources Development shows that water use per capita per year is likely to increase from 655 m\(^3\) in 1990 to as much as 725 m\(^3\)-750 m\(^3\) in 2050 (NCIWRD 1999).
portion seeps into the ground, and the balance forms streams, rivers, and other surface water bodies. Some surface water may enter the ground, adding to groundwater reserves, while part of groundwater may again return to streams and rivers. Since river basins form the natural hydrological unit, estimates of surface water resources are made basin-wise and the annual mean flow in a basin is reckoned to be its water resource. India has 24 identified river basins and the total surface water resource of these basins has been estimated at 1953 km$^3$, which includes a groundwater resource estimated at 432 km$^3$. The annual availability of groundwater is determined by the annual recharge of the aquifer by surface water. Thus the availability of groundwater is intricately linked to the availability of surface water. It is estimated that against the total annual availability of 1953 km$^3$ of the water resource in India, about 1086 km$^3$ (690 km$^3$ of surface water and 396 km$^3$ of groundwater) can be put to use (NCIWRD 1999).

The distribution of freshwater resources in India is uneven over space and time because its availability is largely dictated by precipitation. The lowest rainfall, 0.11 mm, occurs at Jaisalmer in west Rajasthan while the highest, 11690 mm, gets recorded at Cherrapunji in Meghalaya. About 64% of the geographical area of the country accounts for less than 29% of its total water resources. Low precipitation coupled with high evaporation rates makes water an extremely scarce commodity in some parts of the country. Over 80% of the country's annual rainfall is recorded in the summer monsoon, which lasts for 100 to 120 days in a year. With as much as 50% of the annual precipitation taking place in a short period of about 15 days and less than 100 hours all together (NCIWRD 1999), about 40 million hectares (12.16%) of Indian land is also flood-prone (CWC 2000), though all of it is not affected every year.

Against the backdrop of a short and limited water supply scenario, the demand scenario of the country is high, and continuously on the rise. A report of the NCIWRD (1999) estimates that India's population by 2050 will be between 1346 million and 1581 million and the water requirements for irrigation alone (so as to maintain food self-sufficiency) will be in the range of 628 to 807 km$^3$. The water demand for domestic use has been estimated to be in the range of 90 to 111 km$^3$. Accounting for requirements by industry, power, and other sectors, the total water requirement for the year 2050 has been estimated by the NCIWRD to fall between 973 to 1180 km$^3$, against a total utilization level of 552 km$^3$ in 1990. Even if the country's total utilizable potential of 1086 km$^3$ is fully tapped, the projected demand can only just be met. The demand estimate for 2050 shows a phenomenal increase of 76% to 114% over the water usage level of 1990 (depending
on whether the low or high population growth scenario is considered). This increase in projected demand is significantly higher than the projected increase of 60% to 87% in population (under the low or high growth scenario) during the period 1990 to 2050. The population density of India is far from uniform and hence demand pattern of water is uneven over space, besides being uneven over time due to climatic variations. However, variations in the pattern of water demand over space and time are not in tandem with the variation in its supply pattern.

The situation of water imbalance in most parts of the country is critical and fast slipping out of hand. The demand and supply imbalance can be managed by enhancing supply (supply-side solution) or by curtailing demand (demand-side solution). Till now, the focus of initiatives for reducing demand and supply gap has been in seeking supply-side solution. The option of demand-side solution has been ignored, as the challenges posed by it are seemingly complex. But with the challenges of supply-side solution becoming increasingly difficult, the option of demand-side solution can no longer be ignored.

Challenges of the supply-side solution

The supply-side challenge of meeting the present and future demand has three components, namely (1) creating new potential for enhancing supply, (2) achieving equitable distribution, and (3) meeting the needs of sustainable development. An acceptable and sustainable solution for enhancing supplies has to be found within the domain of the supply-side challenge, encompassing all the three components, as illustrated in Figure 1.

![Figure 1 Challenges of a supply-side solution](image_url)
Creation of new supply potential

The first challenge is the creation of a new supply potential for meeting the ever-growing demand for water, with a finite resource. Given the water demand projections, India will be required to tap every single drop of utilizable water resources by 2050. Although the utilizable water resource potential of the country has been estimated at 1086 km$^3$, only about 600 km$^3$ has been put to use till date (NCIWRD 1999). Evidently, with almost 45% of water resources remaining untapped, the country’s water supply capacity has not been exhausted. However, considering the social and environmental constraints and technical and financial inadequacies, the creation and full utilization of balance resources are not easy and assured.

The utilizable surface water resource has been estimated at 690 km$^3$, which can be tapped by impounding water in natural or artificial reservoirs. The minimum live storage of man-made reservoirs required to reap the full potential of surface water is estimated at 385 km$^3$, against which the total completed capacity of reservoirs is 174 km$^3$, while another 76 km$^3$ is under construction (NCIWRD 1999). Thus, to utilize the surface water potential of the country fully, a total storage of 135 km$^3$ (about 78% of the existing capacity) needs to be created from scratch, by building new dams. The task may not be easy if gestation periods and problems associated with the ongoing dam construction projects are taken into account.

Reservoirs are created in river plains or river valleys by submerging a notable portion of the river’s plain and fertile land or forests in the valley. The pressure of population, which even now is leading to encroachments upon forestland (and dwindling of forest reserves), means that the country cannot afford vast tracts of land for submergence by future reservoirs. Added to this is the impact that increased public awareness of social and environmental matters will have, making the task of acquiring land for new reservoirs a tightrope walk. From the point of view of creating storage, advantageous topographical locations closest to human habitat were first explored to keep the cost of water conveyance minimal. Such locations have been exhausted and new projects are to be located at higher altitudes in complex terrain. For new projects, the length of canals and the number of cross-drainage structures will be above normal levels. The complex topology and geology of new project sites will make the cost of storage and water conveyance much higher than that of earlier projects. Because of increased public sensitivity, the proportionate cost of mitigating the social and environmental impact of the projects will also be higher. Militancy-related and other law-and-order problems in certain areas
(especially in the north-eastern region, which has considerable un-tapped potential) are also factors that may contribute to delays and cost overruns.

**Achieving equitable distribution**

The second challenge concerns the equitable distribution of water between different regions of the country; within regions, between urban and rural areas; and within urban and rural areas, between the rich and the poor. The aggregate supply and aggregate demand can be matched at the macro level only by Herculean efforts to create new supplies, but the possibility of matching the supply and demand position at the micro level by judicious and equitable distribution of water is a remote one.

There is a large imbalance in the availability of water between different regions of the country. Out of the 24 river basins in India, one basin (the Ganga-Brahmaputra-Meghna basin) alone accounts for more than 60% of the country’s total water resource. The availability of utilizable water per capita (1991 population level) varies from 182 m$^3$ in the Sabarmati basin to 3082 m$^3$ in the Narmada basin while its availability per hectare of culturable area varies from 1244 m$^3$ in the Sabarmati basin to 8320 m$^3$ in the Mahanadi basin. It is technically feasible to achieve a regional balance in the distribution of water by an inter-basin transfer of water. A few such schemes already exist and there is substantial potential for new ones, but such schemes will require huge reservoirs and large water conductor systems. Apart from the colossal finances, efforts towards the large-scale inter-basin transfer of water will involve considerable displacement of people and significant environmental implications. If completed, such systems are also likely to pose problems arising from the management of conflicts among upper-end and lower-end beneficiaries.

The rural areas have been deprived of a fair share in water resource development despite heavy investments and a focus on them in the early five-year plans. Not surprisingly, 90% of India’s rural population relies on shallow or deep groundwater for drinking purpose (IWRS 1999), and only 8% of them have access to sanitation facilities (World Bank 1999). About 56% of the irrigation in the country is carried out using wells and tubewells (CWC 2000), for which most of the investment is from the private sector. The priority given to creating potential over network development has often excessively delayed

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3 The urban population of India in 1901 constituted 10.84% of total population. Today its proportion is about 30.9% and expected to touch 50% by year 2050 (IWRS 1999).
irrigation benefits reaching the tail end. In such cases, the change in land-use pattern of the command area with increasing urbanization has led to rejection of planned irrigation, while unplanned urban consumption has grown by leaps and bounds.

Within the urban sector, there is gross deficiency in the distribution of water between the rich and the poor. Sewerage facilities where available are unhygienic because of insufficient water making the condition of urban slums pathetic. Only 58% of urban population has access to sanitation facilities (World Bank 1999). Safe drinking water is no more accessible to one and all, only the rich can afford it. The use of aqua-filters, even on municipal supplies, is becoming increasingly necessary. The potable bottled market, estimated at 10 000 million rupees, is growing at an annual rate of 50%, with over 200 brands jostling for a share in the market (News analysis, The Economic Times, p. 6, 11 June 2001). This is an indication of the extent of commercialization of this life-sustaining resource. In rural sectors where surface irrigation facilities are inadequate, excessive groundwater usage has depleted the groundwater table rendering the rural poor at a disadvantage over their richer counterparts who have access to deeper borewells.

**Meeting the needs of sustainable development**

The third challenge is about attaining a sustainable level of development in which the needs of the present can be met without compromising the ability of the resources to meet the needs of the future. If India exhausts its potential of utilizable water resources to meet the projected demand of the 50th year, where will it turn to meet the demands of the 60th or 70th year? The creation of new potential for water resources is at the cost of land resources, which are already under pressure, and hence the issue of sustainable development of land resources is also linked with water resources development. Efforts to create new supplies to match growing demand are almost certain to go against the principle of sustainable development.

One view holds that the Indian population will stabilize by 2050, and that the total aggregate water resource of the country will be just enough to meet the projected demand for that year. Implying that alarmist view is of no good, the suggestion is to tap every available potential water resource in India. The three assumptions made here are: (1) the population will stabilize by year 2050, (2) the per capita needs, 50 years henceforth, will stabilize, and (3) the estimated water resources of the country are enough to meet the demand. During the 1990s, India’s population grew at a decadal rate of 21.34% (Census of
India 2001). To satisfy the first assumption, this decadal growth rate would need to be brought down to zero per cent within the next five decades. The per capita demand of water has been continuously growing with development and even in the projections made for demand, it has been assumed to grow right up to 2050. The second assumption is contradictory to this trend. The estimate of 1086 km$^3$ as the total utilisable water resources potential is probably the best of many available estimates with serious limitations. Further, studies have provided the first tentative evidence that relatively small changes of regional precipitation and evapotranspiration patterns might result in large-scale changes in regional water availability (Kumar, Asthana, and Goel 1999). Hence total reliance on estimated sufficiency of water, as made out in the third assumption, is not warranted.

The social and environmental impact of water resources development is being widely and vigorously debated today. However, the debate is mostly focused on pressing issues related to submergence by reservoirs, with little consideration given to its impact on river stretches downstream of projects. The impounding of rivers mostly in hilly reaches affects thinly populated pockets in terms of submergence, while the consequent reduction in flow of the river downstream affects a larger land area and population of the river plains. For ages, rivers have been the ultimate cleansing agent for wastes created by man due to its self-cleansing property and final access to sea. Unregulated industrialization has increased the burden of rivers by adding chemical wastes to the ever-increasing biological wastes. On the other hand, the quantum of water in rivers has decreased, and sufficient discharge rate is not available for self-cleaning process or for carrying the wastes to the sea. Even at present when only 45% of the total reservoir capacity of India has been developed, many beautiful, wide water ways that earlier existed have become minuscule or disappeared altogether. Most rivers, whose water resource potential has been tapped in the hills, look like waste water drains in the plains. The holiest river Ganga, swallowing 1.3 million litres of sewage daily, is probably the most polluted river today. Thirteen major river basins of India, representing 80% of the total surface water, are polluted, with pollution levels ranging from 20 to 1000 times above normal levels (Editorial, p.6 India Today 25 June 2001). Since the untapped potential of water resources is now confined mostly to very high-altitude areas, further exploitation will exacerbate the threat of river pollution along longer downstream stretches. Undoubtedly this form of development, with adverse effects on health and hygiene is also against the principle of sustainable development.
Challenges of the demand-side solution
The three formidable challenges posed by the demand-side solution are (1) creating new technologies for reducing water demand (2) bringing about changes in the societal mindset about water usage, and (3) initiating and enforcing water-related structural reforms. As illustrated in Figure 2, the solutions should preferably be found for all three components of the demand-side challenge, and success in each will independently add to the overall success of demand management.

\[\text{Figure 2} \quad \text{Challenges of demand-side solution}\]

Creating new technologies
The first challenge of demand-side management is the creation of new technologies for reducing water demand. Nearly 83% of water is used in the agricultural sector, for which contributions through advancements in agricultural technology are two-pronged. One way is to develop higher yielding crop varieties so that the water consumption per unit of the foodgrain produced is reduced. In the existing 80.76 million hectares that form the gross command area of irrigation projects or in the 44.35 million hectares of groundwater-irrigated areas, the use of high-yielding varieties can increase crop production several times over the present national average yield ranging between 1.0 and 2.33 tonnes per hectare, which is lower than 6.0 tonnes per hectares or more, achieved by some countries even today (NCIWRD 1999). Thus, bringing Indian technology on par with developed nations alone can cut down India’s irrigation water requirement to one-third, or even less, of its present-day demand. The second way of reducing the demand of water in agriculture is to
develop crop varieties that require a lower frequency and quantum of water application. Today about 68% of land, which accounts for nearly 40% of the country's total foodgrain production, is under dryland or rainfed farming (Chakraborty and Mukharjee 2001). In this large area, use of low-water consuming plant varieties can help farmers produce food and non-food crops on a sustainable basis.

Research in certain other areas of agriculture can also help in reducing the demand for freshwater. For example, firstly, breakthroughs in developing crop varieties with resistance to low or moderate salinity can augment the total area available for cultivation. This could increase the potential for foodgrain production substantially without increasing the freshwater demand. With such a breakthrough, possibilities of utilizing seawater for irrigation – after its dilution with river water – can also be explored. Secondly, technological advancements in the field of soil moisture retention, enhancement of soil productivity by crop rotation, conjunctive use of water (from rains, tanks, and wells), recycling of animal manure, etc. will help in increasing the sustainable yield of farmers in low rainfall areas (Nanwal 2001). And third, further development of pest and insect-resistant crop varieties can help in checking chemical contamination of surface and groundwater from excessive use of pesticides and insecticides.

Technological developments are also called for in the area of irrigation methodology. The national weighted average value of NIR (net irrigation requirement) is estimated at 0.36 m depth of water application, against which the GIR (gross irrigation requirement) is on an average estimated at 0.65 m in the case of groundwater usage, and 0.9 m in the case of surface-water usage (NCIWRD 1999). The surplus water requirement of about 80% (for groundwater usage) to 150% (for surface water usage) is mainly on account of conveyance and application inefficiencies. It is said that implementation of MIT (micro irrigation technology) can increase crop productivity as well as save water up to 50% (Jain 2000). If made adaptable to Indian conditions, the MIT can considerably increase application efficiency. In the open canal water-conductor system currently in use, the conveyance efficiency is adversely affected due to excessive seepage, evaporation, leakage, evapotranspiration (through weeds), pilferage, etc. Developments to make water conveyance through pressurized pipes cost effective will encourage its usage, thereby removing most of the water losses associated with an open canal system. In addition, this may help in implementing the MIT and also reducing the number of canal-affected oustees.

The present share of drinking and municipal water in the overall usage is about 4.5%, which is likely to increase to 9% in the year...
2050. Similarly, the present share of three per cent of industrial water usage is estimated to rise to five per cent by 2050 (NC IWRD 1999). Being essentially non-consumptive, domestic and industrial water is available for reuse. Advancements in the area of cost-effective treatment and recycling of domestic and industrial waste water will reduce the demand for water and also abate pollution of freshwater sources. Advancements in the area of desalination technology could also reduce the demand for domestic and industrial water substantially.

**Changing societal mindset**

The second challenge of demand-side management is about changing the mindset of society towards usage of water. Despite pockets and periods of deficient rainfall, Indians by and large use water in an abundant manner. The Indian proverb ‘drop by drop the pot can fill up’ underlines the importance of savings, but is rarely practised in the case of water. Open taps in homes and public places needlessly waste precious water. Most leaks in urban distribution systems go unreported, resulting in water losses to the extent of 20% to 40% (IWRS 1999).

Apart from a faulty sense of abundance, the common Indian farmer believes that larger applications of water yields larger produce, and hence overuses it. This not only allows water to go to waste by surface drainage, ground seepage or evaporation, but also affects soil fertility by washing away its nutrients, water-logging, and salination. This calls for changing the traditional view about watering fields, which will enhance the farm yield and phenomenally reduce irrigation water demand. In the recent past, significant work has been done by a few to initiate water conservation and bring about a change in the people’s mindset about water usage. Success stories of some non-governmental organizations in villages of Maharashtra (pani panchayats) and Rajasthan have received good media coverage, which has even encouraged a few others to emulate them. However, such efforts are few, and most of the time localized to areas that are already water-stressed. What is needed more is to bring about changes in the societal mindset of areas where groundwater situations have not yet deteriorated alarmingly, or where surplus capacity can be created from existing irrigation schemes by curtailing the present demand.

Indian society has an aversion to the recycling of waste water, especially for domestic reuse. It is generally accepted that consumptive use of water is only about 20% of the gross urban demand (IWRS 1999) and hence a huge quantity of waste water is generated in urban areas. With increasing population pressures, the supply potential in and around urban centres is no longer sufficient and water has to be
brought from far-off sources, which is expensive and difficult. For example, the new sources for major cities such as Ahmedabad, Bangalore, Chennai, Delhi, and Hyderabad are located at distances ranging between 100 and 400 km from the cities (IWRS 1999). If waste water were to be treated and reused, it would be possible to reduce the freshwater demand for domestic use considerably. Society needs to be educated about the necessity for recycling waste water, and wherever possible allowing treated waste water to re-enter water conveyance systems so as to augment the supply potential of downstream reaches.

**Structural reforms for restraining water demand**

The third challenge of demand-side management lies in bringing about structural reforms for restraining demand. In India, while sources of surface water are generally public property, groundwater sources are treated as part of private property. Even with limited land properties, people can have access to unlimited groundwater reserves by deploying powerful pumps. This has resulted in an uncontrolled exploitation of water in many places, leading to the groundwater table falling to alarming levels.\(^4\) There are practically no laws restraining people from pumping out large quantities of water from private wells or boreholes. The Government of India prepared a model bill for scientific regulation of groundwater as early as 1970, but only Gujarat, Madhya Pradesh, Maharashtra, and Tamil Nadu have enacted groundwater legislations so far (Sekar 2001). Even in these states, legislation is either not implemented or not sound enough to bring about effective control over groundwater abuse. The CGWB (Central Ground Water Board) was created as per the Supreme Court direction of December 1996 for the purpose of regulation and control in groundwater management and development (Sekar 2001). However, the powers vested with the CGWB seem to be inadequate, and it has not been able to deal with the sensitive issues effectively. While absolute control over the withdrawal of groundwater may not be desirable or practicable, there is an urgent need for putting controls on the capacity and power of privately-owned groundwater pumps. A proper environment for groundwater marketing needs to be created to facilitate sharing of groundwater sources. An ‘area approach’ should be adopted for control and efforts should be made to

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\(^4\) With scanty rainfall and continuous groundwater exploitation, the water table in areas of north Gujarat, Saurashtra, and Kachchh has been lowered beyond 300 m. This has caused advancement of salinity ingress by about 6 km from the coastline of these areas (SSN NL 2001).
reduce the total number of tube-wells in an area. Area-wise docu-
mentation of tubewells, water extraction, and water recharging
should be carried out as part of groundwater monitoring. In areas
where recharging falls short of extraction, suitable controls should be
exercised to regulate groundwater demand. In areas subjected to
alarming levels of groundwater depletion, irrigation by groundwater
should be banned for appropriate periods, till the situation is normal-
ized. Meaningful structural reforms need to be brought about by en-
acting appropriate laws and suitably empowering regulating agencies.
Reforms will be more effective if controls are decentralized and local-
level bodies (panchayats, municipalities, etc.) are empowered. Im-
parting education to people about the pitfalls of groundwater misuse
and the necessities of regulation needs to precede enforcement of
regulations.

Another aspect calling for structural reforms to improve demand-
side management is the pollution of surface and groundwater bodies.
Even though water may be available if it is excessively polluted it be-
comes unfit for drinking or even irrigation. A case in point is that of
Ahmedabad city, where the water of the Sabarmati river as well as the
groundwater are getting increasingly polluted by industrial toxic
waste. Besides, domestic waste and farm waste (with a high content
of pesticides and insecticides) are also responsible for increasing pol-
lution. The Environment Protection Act, 1986, empowers the central
government to take expedient measures to protect and improve the
quality of the environment, including that of water (NCIWRD
1999). There are several other acts and regulations at the central and
state levels to safeguard water bodies from the disposal of toxic and
hazardous wastes. Nevertheless, vast stretches of rivers, lakes, and
ponds, and also subsoil water are subjected to onerous levels of pollu-
tion today. There is an urgent need to educate people about their
duties and rights on pollution-related issues, and to strengthen regu-
latory institutions.

The demand for irrigation water is considerably affected by the
farmer’s choice of crops and cropping pattern. The choice of crops is
largely influenced by the differential money available to the farmer,
which, in turn, is governed by the pricing of farm inputs and outputs.
With highly subsidized energy charges (diesel and farm electricity
charges) for groundwater, and abysmally low surface irrigation
charges, water as an input-cost factor seldom influences the farmer’s
choice of crops. On the other hand, intervention in regulating the
prices of other inputs and outputs and the export-import restrictions
by the government can play a vital role in influencing the crops and
cropping pattern of the area. Often this leads to serious distortions in
the cropping pattern, with water-intensive crops becoming the prime choice of farmers. This affects the groundwater table adversely, and in cases of surface irrigation schemes, deprives the tail-end farmers of even the minimum supply of irrigation water. This problem has already assumed serious proportions, and new irrigation projects such as the Sardar Sarovar Project are subject to questions regarding their promised irrigation potential in light of the farmers' tendency to go in for water-intensive and cash-rewarding crops such as sugar cane. There is an urgent need to check this distortion in cropping pattern by suitable policy initiatives in farm input and output pricing and export-import regulations.

Reforms in the area of water pricing are probably most crucially needed for influencing irrigation water demand. At present, irrigation water rates in most states are a negligible fraction of the total farm input costs, and in a few cases, such as in Punjab, water comes to the farm free of cost. In some states, the water charges are hidden as they are levied along with land revenues, while in others they are levied on a per hectare basis, rather than a volumetric basis. Thus a large number of Indian farmers enjoy the benefits of irrigation from numerous water resources projects with scant regard for volumetric consumption. They draw more water from the irrigation systems than what is genuinely needed, thereby inflating irrigation demand considerably. There is an urgent need to correct the manner and magnitude of water pricing so as to create an impact on irrigation demand. The charges for irrigation water should be levied on a volumetric basis at the last government-controlled outlet. Logically, the annual recovery made should cover a portion of capital investment and full portion of the O&M (operation and maintenance) cost. However, since irrigation projects in India are constructed and operated at very high costs – often on account of organizational inefficiencies – levying water prices on actual cost basis would be inappropriate and impracticable. In the absence of a viable alternative to the farmer, this would mean loading the cost-inefficiency of the project on to the farm-input costs, thereby reducing the farm's cost efficiency. So, instead of the cost-recovery aspect, the focus of irrigation pricing should be on creation of a deterrent against overuse or misuse of water. One such way is to raise water prices to a level, where its impact per unit of the produce becomes comparable with the cost impact of other farm inputs such as seeds and fertilizer. Since enhanced irrigation water prices will affect the competitiveness of farm produce, it should be comparable with the tangible cost of pumped groundwater, and should be uniformly implemented across different states. A meaningful irrigation pricing reform (to check total irrigation
water demand) can be accomplished only if subsidies on energy charges of groundwater pumping are also curtailed rationally. Reforms in the area of pricing of domestic and industrial water will also influence the total water demand. While there will be a reduction in the wasteful consumption of water in the domestic sector; in the industrial sector, this will encourage the introduction of technologies for recycling water. However, once again with the organizational inefficiencies of a government-controlled supply set-up, the water prices cannot be governed by economic factors alone. Further, with an increase in water prices, there is an increasing tendency for tampering with water meters and water thefts, which usually go unchecked in the government set-up. Privatization of the domestic and industrial water supply sectors will allow economic and market-driven factors to govern water prices, which will improve the demand situation significantly.

Need for balancing supply and demand solutions
The above discussion on challenges of supply and demand solutions points to the reality that seeking a total supply-side solution is increasingly becoming unattainable, while the demand-side solution, though not easy, is attainable. However, since a demand-side solution in itself cannot provide the whole solution to the water problem, there is a case for balancing the two solutions.

With the deepening of the water crisis, a countrywide debate has been generated on the manner of water resources development, especially on the ‘large-versus-small-dams’ theme. The choice of ‘large’ or ‘small’ dam is mostly governed by site-specific parameters and as such very few cases permit the choice of very large dams. For a given source, since a larger dam generally allows for more units of storage per unit of investment, it is preferred. Nevertheless, the creation of dams – whether large or small – is to create new supply sources, and hence the debate is focused on the supply-side solution alone. The points below highlight the critical status of today’s supply-side situation, and emphasize the need for co-opting the demand-side solution.

1 Since independence and up to 1997, about 1323.90 billion rupees (at the 1996/97 price level) was spent on major and medium projects. The figure stands at a gross amount of 2313.87 billion rupees if expenditures on flood control, minor projects, and command-area development are also added (NClWRD 1999). Though in the planning stages, the economic returns of the above investment were estimated to be positive, yet conclusive studies are not available to prove it so.
2 Some projects that started in the 1950s have still not been completed. Of 292 major and multipurpose projects that were taken up until the end of the Eighth Five-year Plan, only 130 have been completed. For the remaining, the spillover cost at the beginning of the Ninth Plan worked out to 1361.33 billion rupees (NCIWRD 1999). All the completed projects are not complete in the true sense of potential utilization, and remain open-ended for want of further investment. The next few five-year plans are going to remain in the vicious trap of cost-spillover of ongoing projects, owing to scarcity of funds with the government.

3 In the initial stages of development, India gave highest priority to irrigation. But with other sectors of economy demanding equal or more attention, the percentage of plan outlays went down from 22.5% in the initial plans to 6.5% in recent ones (NCIWRD 1999). Currently, when large investments are required in the areas of education, health, infrastructure, research and development, besides agricultural and industrial sectors, the central or state governments can ill afford total reliance on the expensive supply-side solution.

4 The financial angle of the supply-side solution is not attractive for private sector participation. The average cost of irrigation water on the basis of investment is estimated to be about 90 paise per thousand litres, while the average prevailing water rates for different crops are in range of 1.33–3.50 paise. The financial returns from water resources projects are not sufficient to recover even O&M charges. Against the working expenditure (including interest on capital) of 1032 rupees per hectare of irrigated land, the average gross receipt in 1991/92 was 82 rupees (N avalawala 2001).

5 The time delays associated with early projects were mostly on account of financial constraints. But today, the social, environmental, and political aspects have also become limiting factors in supply-side management. The three challenges of the supply-side solution are individually difficult and because they need simultaneous tackling pose a mammoth problem. In comparison, the three challenges of the demand-side solution are softer and can be tackled separately.

6 Since every unit of water saved adds to supply created, demand management can curtail the need for supply creation to a significant extent. Demand-side solution projects can be taken up on a smaller scale and distributed over time and space. They can be planned to yield financial returns, and hence attract private participation.
The balanced water management approach

The per capita AWR (annual water resource) of the country is ceaselessly decreasing and likely to fall below 1000 m$^3$ by year 2010, thereby pushing India on the list of water-stressed countries. Though there is considerable awareness of the impending crisis, a rigid and conventional approach is being adopted for seeking solutions to its aspects related to planning, investments, construction, conflict resolutions, benefit utilization, etc. The need today is, however, for a paradigm shift in India’s approach to the water resources problem with the focus on ‘water management’ rather than on ‘water supply’. With a balanced approach to supply and demand management, the key initiatives needed for bringing about the desired shift are listed below.

1. The objective of water resources development should be to maximize water utilization instead of increasing supply only. The focus of planning should shift from a supply-side solution to a balance of demand and supply solutions, which would mean planning for bare necessary new supplies after accounting for the potential of demand management and supply-side improvements in the existing supply capacity.

2. The existing storage capacity is falling due to siltation of reservoirs, generally at rates higher than the designed siltation rates. It is estimated that almost 65 km$^3$ of the 385 km$^3$ live storage capacity (about 17%) available today will be lost by 2050 (NCIWRD 1999). Appropriate CAT (catchment area treatment) measures can reduce siltation of reservoirs. The storage salvaged by CAT will be equivalent to new storage creation at lower costs, without creating new delivery networks and without social or environmental repercussions.

3. Nationwide uniform norms for domestic supplies, or for agricultural and industrial developments, will lead to creation of water-stressed pockets. The local potential and possibilities for outsourcing of water should be determined on a realistic basis keeping in view political, social, topographical, environmental, and economic constraints. The sustainable supply potential thus estimated should govern the norms of domestic supply and growth of agriculture and industries.

4. To create a globally competitive advantage for agriculture (with the liberalization of world trade), India needs to make agricultural produce globally competitive in real value terms by reducing input-costs and subsidies. Financial inefficiency of irrigation projects needs to be corrected to reduce farm-water subsidies.
Large-scale projects are mostly found to fall short of targets (Parasuraman and Sengupta 2001). Adopting an incremental approach to development, meaningful phasing out of large projects should be carried out. This will allow for better time and cost controls; manageable number of oustees; gradual impact on ecosystems; a smaller potential–utilization gap; and better planning of the next phase with updated data and access to newer technologies.

Even the projects that are excessively cost-overrun due to delays are being justified on review because project benefits are subjected to the same escalation as project costs. The focus of construction should shift from cost controls to time controls, which lays emphasis on opportunity cost of money and on time-barred benefits of the project.

Benefits of the projects should be assured in terms of time, quality, and quantity, and should be charged at rational prices.

Encouragement and incentives for water marketing, irrigation technology industries, rural venture capital funds, etc. will help bring private investment into water resources development.

Institutional and regulatory reforms

Although India has a federal set-up with a strong central government, practically all powers related to the growth and management of water resources have been constitutionally delegated to the state governments. With very limited control – only by way of clearances for certain category projects, partial funding in specific cases, and technical advice on demand – the central government at present is ill-equipped to play a vital role in transforming the water resources sector of the country. Since the river basin forms the natural hydrological unit for surface water, since groundwater replenishment is intricately linked to surface-water availability, and since most of river basins extend beyond the boundaries of one (or multiple) state(s); equitable and integrated supply-side development will not be possible by the incoherent efforts of state governments alone. Similarly the issue of demand-side management cannot be left entirely to the state governments. In doing so, capacity-rich states will show little interest in reducing demand; and even if they do, the benefit of surplus capacity thus generated may not necessarily pass on to the capacity-deficient states. The issue of pollution control of river water also trespasses state boundaries, with the downstream states benefiting most from pollution control efforts of upstream states.

For the implementation of meaningful water management reforms (both supply and demand sides), the present situation of a weak central role needs to be altered. This can be achieved by bringing water
into the concurrent list, from its present position under the state list of the constitution. Though resistance to such a move is inevitable, there is an urgent need to empower the central government to play a crucial role in the functional areas listed below.

1. The inter-state disputes on sharing of river waters have become major factors in the slow supply-side development. Considering the situations in the Kaveri, Krishna, Narmada\(^5\) and many other rivers under dispute, the responsibility for planning and construction of storage on all major inter-state rivers – with the focus on basin level development – should be entrusted to the central government. However, the responsibility for distribution of water below the off-take points of such national projects should be vested with the state government.

2. Demand reduction is inter-linked with resource allocation, which, in turn, is linked with supply development. Basinwise supply and usage estimations (for both surface and ground water) should be worked out by the central government, which should form the basis for a judicious state allocation. A national registry of water users should also be created to serve as the technical and information base for water allocation at various levels (Saleth and Dinar 2000).

3. Pollutants added by states to inter-state rivers should be monitored by the central government, and the allocation of water to these states should be subjected to adjustments to account for their pollution levels.

The responsibility for water resources currently confined to administrative boundaries of states should continue to rest with state governments, but with greater involvement of user groups in their management. The state departments are largely accountable for the present underdeveloped status of water resources in the country (despite heavy investment and sound technical knowledge) for reasons such as financial indiscipline, disjointed and uncoordinated efforts, myopic political interference, sectorial bias, policy and administrative weaknesses, and resistance to reforms. Water user groups should come forward to take on some of the responsibilities of the state machinery, especially in the development, operation, and maintenance of the canal and distribution systems. Lessons can be learned from the experience of Mexico, where public irrigation systems to an ex-

\(^5\) Even the highly acclaimed Narmada Water Disputes Tribunal Award, which took 10 years for dispute resolution among Narmada basin states, has not been able to clear all hurdles and set the much-needed pace for the development of the Sardar Sarovar Project.
tent of 2.6 million hectares were transferred to about 386 water user associations, which led to dramatic improvements in cost recovery, system maintenance, staff reduction, and even notable improvements in yield and water use efficiency (Saleth and Dinar 2000).

Inter-sectoral and regional allocations of water within the states should be judiciously carried out, preferably on the basis of information from a national registry mentioned earlier. This will facilitate sharing of responsibilities by water users’ associations at the planning and construction stage, and greater stakeholder participation. A system for allocation of water will also facilitate private sector participation, especially for development and management of resources in urban areas. Along with a water-allocation policy and supporting laws, laws should also be enacted for the creation of transferrable water rights, which will provide the motivation for demand management, especially in the industrial sector.

**Conclusion**

With the country’s water potential, it is possible to alleviate the water crisis by adopting a balanced approach towards demand and supply solutions. A balanced water management approach, involving radical changes in policies, practices, performance, and public behaviour, apart from changes in constitutional provisions, is required to bridge the gap between demand and supply. Such an approach alone can solve India’s water crisis in a sustainable manner.

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Disaster-preparedness and recovery: a priority for telecom regulatory agencies in liberalized environments

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Abstract
Telecom infrastructure is assigned a special position in policy because of its important role in the everyday functioning of society. In addition to the direct effects of loss of service, telecom failures cripple coordination capabilities, hindering rescue and recovery operations. Effective disaster-preparedness and recovery is a socio-political objective that any government must attend to. In the case of government- or private-monopoly provision, the government may issue general directives to the management, directly intervene in management functions under 'emergency' conditions, and assume all or the bulk of disaster recovery costs. In the 'new' order of private provision of telecom services, a different response is required.

Disaster-preparedness and recovery by private operators cannot be ensured through licenses or concessions alone. The impossibility of making long-term contracts that address all contingencies applies with amplified force to disaster-related provisions. Therefore, independent regulatory agencies are a part of the solution.

This paper addresses the theory and practice of regulatory intervention in disaster-preparedness and recovery drawing from a pilot study conducted by the Telecom Regulatory Commission of Sri Lanka with the support of ICO Global Communications in 1998/99. The elements of effective design of appropriate legislative and license provisions are discussed. Issues of cost containment of disaster-preparedness and recovery measures and the allocation of responsibilities and risks are delineated and the benefits of competitive markets and new technologies for effective use of telecommunications in disaster management are identified.
Introduction

Telecommunications infrastructure is assigned a special position in policy partly because of its important role in the everyday functioning of society. The best way to appreciate that role is to experience or imagine the effects of a disaster that partially or completely affects the telecom infrastructure. In addition to the direct effects of loss of service, the failure of the telecom infrastructure cripples coordination capabilities and significantly hinders rescue-and-recovery operations. Repairs to other infrastructure facilities, usually also affected by disasters, are difficult to conduct in the absence of a working telecom system.

Governments and international organizations have always assigned importance to infrastructure development. The failure, in most parts of the developing world, of efforts to build up universally available and reliable telecom infrastructure within a framework of government monopoly led to a focus on private participation in infrastructure development in the past few decades. The present period is one in which a ‘paradigm shift’ away from government-monopoly supply has been completed in telecom. For example, 98 countries privatized their government-owned telecom sectors in the past decade (ITU 2001). Institutional reforms usually include three components, implemented simultaneously or in staggered order: (1) organizational reform of incumbent operator, including privatization; (2) introduction of competition in entirety, or more commonly in parts, of the sector; and (3) the creation of independent, or at least separate, sector-specific regulatory agencies to oversee the reformed sector. The primary purpose of these new agencies, especially in developing countries, is to provide stability and certainty to the new private investors against arbitrary takings by the government (Levy and Spiller 1994). However, all regulatory agencies are assigned multiple functions that fall under the broad headings of regulation to create and maintain conditions for competition, regulation of oligopoly/monopoly, and regulation to achieve social-political objectives (Prosser 1997).

Disaster-preparedness and recovery is an important socio-political objective, which has a significant effect on other regulatory functions. This paper examines the theory and practice of regulatory intervention in disaster-preparedness and recovery. It seeks to identify the elements of effective regulatory responses to disaster-preparedness and recovery by analysing the findings of a pilot study on the use of telecommunications in disaster and emergency situations in Sri Lanka. The study was conducted in 1998/99 by the TRSCL (Telecommuni-
cations Regulatory Commission of Sri Lanka) and was funded by ICO Global Communications, a satellite phone operator based in the UK. The conclusions are directly applicable to developing countries but may be of some value to the development of effective disaster management in infrastructure sectors in developed countries as well.

**The rationale for disaster-preparedness/recovery regulation**

Effective disaster-preparedness and recovery, especially of telecom, is a socio-political objective that any government must attend to, under any industrial structure. In the case of government-monopoly supply, the government may issue general directives to the management, directly intervene in management functions under ‘emergency’ conditions, and assume all or the bulk of disaster recovery costs. In ideal circumstances, there would be no need for additional oversight to ensure proper disaster-preparedness or recovery behaviour by the management, because they implement the will of the government. However, in reality and as postulated in public-policy theory, the government, the ‘principal’, has difficulty in ensuring the implementation of its wishes by the management of the monopoly, the ‘agent’. Monopoly managers are subject to multiple incentives and may neglect their disaster-preparedness and recovery mandates, which, after all, are rarely noticed in normal times. Therefore, even in countries that are under the ‘old’ order, there may be a need for ‘regulatory’ oversight of infrastructure operators from special emergency managers or legislative committees, if not from formal regulatory agencies.

In the ‘new’ order, no single operator can be expected to prepare for, and recover from, disasters. In addition, all operators, including the former monopolist, will now claim that they are driven by the ‘bottom line’, and cannot expend resources on activities that do not contribute to profit. They will also resist presumed interference in management by the government. It is possible to envisage market pressures yielding adequate disaster-preparedness and recovery in competitive conditions (consumers with complete information and easy exit and entry). As customers value reliable service, including adequate levels of disaster-preparedness and recovery, they can be expected to factor this element into their service-purchasing decisions. They will have enough information about these service qualities, will be able to exit from under-performing suppliers at little or no cost, and will have alternative suppliers to turn to. However, these assumptions do not hold in infrastructure sectors. In addition, the significant negative externalities of infrastructure failure justify gov-
ernment action. Therefore, regulation of infrastructure providers in terms of disaster-preparedness and recovery is justified even after liberalization.

Disaster-preparedness/recovery regulation under liberalization

Explicit statement of expectations, non-discrimination, and fair and consistent treatment are key elements of a stable environment for private investment in infrastructure. If government informs all potential investors of its expectations including specified levels of disaster-preparedness and recovery capabilities, prior to the investment being made, that can be incorporated into investment decisions. If all competitors are obligated to meet more or less similar standards, there can be no complaint, in that disaster-preparedness and recovery costs become part of the conditions of that market. If the problem can be solved with only these two actions, disaster-preparedness and recovery by private operators can be ensured through licences or concessions alone. However, the impossibility of making long-term concession agreements that address all possible contingencies applies with amplified force to disaster-related provisions. After all, a disaster is, in most cases, an unpredictable and indeterminate event.

Therefore, it is necessary to apply the solution of the independent regulatory agency to the problem of disaster-preparedness and recovery. The concession, licence, public law or regulation should contain general statements of government expectations regarding disaster-preparedness and recovery by private operators. The regulatory agency should have the power to interpret and apply those general principles to specific circumstances. This power cannot be unconstrained because that would lay open investors to arbitrary takings. The power must be exercised in a fair and consistent manner, adhering as much as possible to regulatory best practice that includes reliance on expertise, transparency, the public interest, and the communications thereof (Samarajiva 2000a). The qualification, ‘as much as possible’, is merited because the exigencies of disasters may not allow for ideal forms of consultative decision-making.

It has been observed that the responsiveness of government to disasters is an element in the general legitimacy of government. In the same way, a regulatory agency’s responsiveness to a disaster can be critical in gaining much-needed legitimacy. Disaster management is a regulatory activity that extends benefits beyond the relatively privileged minorities that have access to telecom networks in most developing countries, as pointed out by the Sri Lankan Minister of Telecom.
The use of telecommunications in disaster management is an effective way of leveraging its potential beyond those who can directly afford it. A disaster team that is properly equipped can help not only the affluent person carrying a cell phone in his briefcase, but also the not-so-affluent person who does not have a phone in her home (Samaraweera 1998).

In this context, it is surprising that disaster management does not appear as a regulatory priority in telecom as evidenced, for example, by its absence in the comprehensive list produced at the first ITU (International Telecommunication Union) Development Symposium for Regulators (ITU 2000).

**Case of the Sri Lankan telecom sector**

*Pre-reform disaster management*

The pre-reform period may be seen as made up of two parts. Prior to 1991, a government department supplied telecom services, under the Telecommunications Ordinance, the administrative and financial regulations of the government applicable to all departments, and the directives of the minister and the cabinet. There was less than one telephone per hundred inhabitants; service quality was atrocious; and waiting time for new connections, for those unable to bypass the waiting list, exceeded 10 years. There were no specific mechanisms for disaster-preparedness and recovery. Normal engineering calculations were used in dimensioning the system, which included certain redundancy factors. In fact, given the department’s lethargy, around 35% of exchange capacity was perennially unused. In the event of a disaster, the department responded in normal government fashion: it purchased replacement equipment outside normal procurement rules; threw practically unlimited labour resources at the problem; and restored service as quickly as necessary. The intensity of the response was modulated by the degree of political concern. Not much attention was paid to costs, which were absorbed by the opaque government financial system.

The preliminary phase of sector reforms began in 1991 with a new Act. A regulatory authority, still a government department, was separated from the Department of Telecommunications, which was corporatized and renamed SLT (Sri Lanka Telecom). In its first year of existence, the badly under-resourced authority issued three licences, the second being to SLT. The licences were extremely detailed, extending to 16 pages of single-spaced small-font print. There were 38 conditions that spelled out the obligations of the licensee with regard to matters such as anti-competitive practices, numbering
plans, itemized billing and confidentiality of customer information. They were modified versions of the early licences issued by the Office of Telecommunications, the UK telecom regulator (Samarajiva 1997). These three licences (and most subsequent ones) included several conditions pertinent to disaster management including

- a condition requiring the licensee to provide public emergency call services to emergency organizations;
- one mandating the provision of maritime and aeronautical emergency services for the safety of life;
- a requirement that the licensee make plans for rapid restoration of services during public emergencies, after necessary consultations with relevant agencies, and implement them; and
- an obligation to provide priority fault repair service to emergency organizations.

The authority did not enforce these conditions. The incumbent operator’s compliance actually declined in this period as a result of the discontinuance of the short-number emergency dialling capability.

Post-reform disaster management

The Sri Lankan telecom sector entered a major phase of reform in 1996/97. In 1996, two fixed operators were licenced to compete with the incumbent in all markets except international. The incumbent was converted from a government corporation to a company named SLTL (Sri Lanka Telecom Ltd). In the face of imminent competition, SLTL increased rollout significantly. At the same time, a previously licenced fourth mobile operator entered the market, igniting rapid growth in the mobile market. In 1997, 35% of SLTL was sold to Nippon Telegraph and Telecom Corporation, which was also contracted to manage the company. An amendment to the law in 1996 (implemented in 1997) made the regulatory agency more independent and gave it adequate resources (Samarajiva 2000b). A new director-general (the author of this paper) was appointed and the professional staff was doubled in 1998.

At this time, the commission sought to enforce licence conditions, including those relevant to disaster management. It was found that all parties, including the regulatory agency, had ignored most of the licence conditions since the issue of licences. In the face of a massive enforcement problem, the commission adopted a multi-pronged approach that included tough enforcement of some licence conditions (to the point of forcing the incumbent to compensate customers a total of around 1 million dollars) and educational/persuasive efforts on others. Given the availability of external resources in the form of a
grant of around 12 000 dollars from ICO Global Communications and the need to prepare for Sri Lanka’s accession to the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations, a pilot study was undertaken (TRCSL 1999a). The study included surveys of operators and emergency-related organizations, multiple meetings with operators including a national workshop and media activity. This initiative was loosely articulated with the ongoing preparations to meet the Y2K problem, which was described in commission documents as a disaster of uncertain proportions but with a date certain.

The intense interactions with operators in the context of a broad programme of disaster-awareness raising were quite educative. Much of the discussion referred to Sri Lanka’s endemic man-made disaster of terrorism, which included a series of deadly suicide bombing attacks on the capital city. The correlation between bomb attacks and telecom network failures was so strong that some inferred an attack had occurred whenever the network failed. Some even believed that the government shut down the telecom network to control news and rumours in the aftermath of an attack. Investigation showed that neither the government nor the security forces nor the incumbent operator were organized enough to shut down the network in such a manner. Operators coping with average annual growth rates of around 50% (higher in some switching centres) were eating into the capacity margins normally set aside to handle sudden surges in use (TRCSL 1999a, p. 32). As a result, when the natural surge in use caused by the first news of an attack began, the entire system would crash. There were no load-shedding mechanisms in place to prevent network failure. The other option of establishing a priority system, wherein the network would be shut down except for a subset of priority numbers belonging to disaster-response organizations, was also not implemented. The only thing that worked was crude redundancy. Organizations that subscribed to multiple telecom providers (Sri Lanka had three fixed-access and four mobile-access providers at this time) found that some networks functioned in post-attack situations. However, it was possible only to make intra-network calls at these times because of congestion and failure in other networks and at interconnection points. One remedy that was implemented as a result of the study was the equipping of the ambulances of the major trauma hospital that treated bomb-attack victims with radio-communication capabilities, using a non-interconnected trunk-radio system (TRCSL 1999b). Several critical government offices subscribed to multiple telecom providers, perhaps as a result of the dissemination of these findings.
The study process and the related activities that led to the installation of the trunk-radio communications in the ambulances also pointed to little-noticed vulnerability in mobile networks. Because the hospital’s service area was well served by multiple mobile networks, the commission’s staff on the emergency taskforce investigated the possibilities of providing fixed mobile phones to the ambulances. However, it was then realized that mobile base stations can get overloaded very easily and that it was almost certain that bases stations close to disasters would be overloaded by increased calling attempts in the area, even if the overall network was unaffected by the disaster. In the absence of an effective priority system or a load-shedding mechanism, a mobile network would be quite ineffective in a disaster area (Anderson and Gow 2001).

As could be expected in a liberalized environment, operators raised concerns about the costs of the various disaster-management actions proposed during the consultations. In the context of the need to upgrade emergency maritime services to maintain adherence to international treaty obligations, the incumbent also made extravagant claims for compensation by the government for functions clearly covered by the licence. While pointing out the clear obligations specified in the licences, the Final Report left open the possibilities of utilizing a portion of the licence fees collected by the commission for disaster-management purposes and of imposing a direct ‘emergency management levy’ on all customer bills.

Problems identified

Several regulatory problems may be identified from the analysis of pre-reform and post-reform disaster management in the Sri Lankan telecom sector. The first is the difficulty of implementing proper emergency management policies in the larger context of semi-functional regulation. It is not possible to assign blame for non-enforcement of disaster-related licence conditions when practically all the licence conditions were not being enforced.

On their face, the licence conditions were highly detailed. But the detail masked weaknesses. The licence conditions were rife with ambiguity. To actually enforce these licence conditions on recalcitrant operators, it would first be necessary to go through some form of public proceeding to establish the precise nature of the obligations set out in the license conditions. It would also be necessary to ensure that the various actions required of government agencies, including the regulatory agency, were duly taken.

The problem may be illustrated by the analysis of the licence condition on special arrangements for emergencies, which is central to disaster recovery.
8.1 The operator shall, after consultation with the authorities, be responsible for emergency organizations and such government departments as the authority may from time to time determine and whose names are notified to the operator by the authority for the purpose, shall make plans and other arrangements for the provision or, as the case may be, the rapid restoration of such telecommunication services as are practicable and may reasonably be required in public emergencies.

8.2 The operator shall, on request by any such person as is designated for the purpose in the relevant plans and arrangements, implement those plans or arrangements in so far as it is reasonable and practicable to do so.

8.3 Nothing in this condition precludes the operator from

8.3.1 recovering the costs which it incurs in making or implementing any such plans or arrangements from those, on behalf of or in consultation with whom the plans or arrangements are made; or

8.3.2 making the implementation of any plan or arrangement conditional upon the person or persons for whom or on whose behalf that plan or arrangement is to be implemented indemnifying the operator for all costs incurred as a consequence of the implementation.

8.4 Nothing in this condition shall restrain the person or persons referred to in paragraphs 8.3.1 or 8.3.2 from the right to obtain the services referred to in this condition on a competitive basis conditional to compliance of the requirements stipulated by the operator (TRCSL 1997).

However detailed the language is, the obligations of the operator are not clear-cut. For example, if the regulatory agency does not notify the operator of the relevant emergency authority and departments, the operator has an excuse for not consulting with them; in the absence of consultations for whatever reason, it has an excuse for not making plans and arrangements, and so on. The language does not allow the regulatory agency, which more than any other entity in the government has expertise in telecom, to be directly involved in disaster-preparedness activities. There is far too much ambiguity in the phrases ‘as are practicable’ and ‘may be reasonably required in public emergencies.’ Even the implementation of restoration plans is conditional on action by an entity other than the operator and gives the operator leeway through the phrase ‘in so far as it is reasonable and practicable to do so.’

The language in the licence conditions will work with an administrative relationship such as that between a government corporation
and the ministry that it reports to. In such a setting, the senior civil servant in the ministry can interpret the language and issue directives. The operator may grumble, but will obey. The problem is that the language is not specific enough to be effective in a liberalized environment where the relationship between the operator, now a private company, and the regulatory agency, no longer having general administrative authority over the operator, is somewhat adversarial.

The ambiguities in the mandatory language may be reduced by holding a public hearing to specify the obligations and by ensuring that specified actions by entities other than the operator are taken at the appropriate times. However, the cost-recovery provisions in sub-condition 8.3 create the conditions for protracted disputes after implementation. Because the operator would have the best information on costs of implementation (as well as of alternative and less costly methods), it would be extremely difficult to prevent extortion of emergency organizations by an opportunistic operator. What was also discovered in the course of the pilot project was that the payments had to be made by emergency authorities, not the regulatory agency. At least in the Sri Lankan conditions of 1998/99, the emergency authorities (e.g., the Ministry of Social Services) were quite impoverished compared to the regulatory agency.

In sum, the analysis of emergency conditions in the Sri Lankan licences shows that inadequate thought had been given to the practical problems of enforcement in a liberalized environment where operators are focused on their bottom lines and in maximizing their power differentials in relation to the regulatory agency. Language such as that found in sub-condition 8.4 shows confusion on the part of the drafters: an appreciation of the value of competition in preventing extortion by a monopolist combined with a lack of understanding of what it takes to restore a failed telecom network. It is likely that these problems exist in other countries as well.

The pilot study revealed several other regulatory problems. It is clear that for telecom networks of any kind to be usable in disaster situations, the problem of congestion and network failure due to the spike in use that usually accompanies the onset of a sudden disaster must be addressed. The crude solution is that of load-shedding; irrespective of their nature, the network will automatically shed calls that are beyond its ability to handle. This solution does not necessarily require regulatory intervention, in that operators can simply implement it as part of network management. However, where operators do not implement load-shedding but allow the network to crash, there may be cause for regulatory intervention.

Load-shedding reduces the time that the network is effectively unusable. Without it, more time would be taken to restore the network.
to normal operation. However, load-shedding does not assist but actually hinders disaster-management. The instrument that will both prevent network overload and assist disaster-management personnel is a priority call system. Here the network does not blindly shed any and all calls; it blocks calls that are not identified as priority calls in order to enable those with priority to use the network for disaster-management purposes. The mechanical aspects of implementing a priority system on a fixed network are well known. The difficulty here is the regulatory task of creating and maintaining an accurate priority list and ensuring that the operators strictly abide by the stated rules. Given the desire to be able to communicate in a crisis situation, it is possible that persons unconnected to disaster management will get on the list, unless it is carefully managed. The Sri Lankan operators expressed concern that the existence of a priority system in one network and not in another could be used as a low-profile marketing tool against the former, because most consumers would not like the idea of being dropped from the network in a disaster situation.

It appears that not enough is known about the implementation of priority systems in mobile networks. Unlike in fixed networks where a particular number is permanently attached to a specific switch, the relationship between call originating instruments and the switches is much more fluid in mobile networks. According to Anderson and Gow’s (2001) research in Canada, this poses serious difficulties for the effective implementation of priority systems.

The above problems associated with priority systems are difficult, but solutions can be found. Anderson and Gow (2001) have identified a problem with priority systems that lacks an easy solution. Priority systems assume that the disaster managers can be identified beforehand. However, it is not possible to assume that those who require communication capabilities for disaster management are the political leadership, the police, fire fighters and such personnel; in many cases, ad hoc emergency managers emerge from the community and play the most critical roles.

Solutions

In one view, a disaster cannot be prepared for. It is a force majeure, an act outside human control. However, it is possible to mitigate the effects of disasters. For example, the accurate weather predictions and warnings that preceded India’s Orissa super cyclone of 1999 enabled a major evacuation from the coastal areas and reduced what was still a massive death toll (Free Press Journal 1999). It is possible to reduce the vulnerability of infrastructure to damage, to minimize the damage and to build in redundancy so that services can be restored quickly. In a liberalized environment, it may be argued that these de-
decisions are managerial, and generally outside the scope of regulatory intervention. However, the regulatory agency can provide incentives for actions that will achieve the desired socio-political objectives at reasonable cost, without infringing on managerial autonomy.

If, for example, the de jure or de facto practice is for the government, international agencies or the consumer to bear the full costs of disaster recovery, there would be no incentive for a private or corporatized operator to design and operate an infrastructure in a way that would minimize damage from disaster. In the absence of penalties for system failure and slow recovery caused by inadequate preparation for disaster, there are no incentives to design resilient systems and procedures for quick restoration of services. The Sri Lankan case shows the weakness of relying on licence conditions and mandates alone, without effective incentives in the form of clear allocation of responsibilities for costs of disaster-preparedness and recovery.

Insurance may be seen as a logical solution. It is a good method of managing risk, but it is not a cure-all. If the insurance scheme is not properly designed, it can shift all the costs to consumers (many of whom may not even experience the disaster) without creating incentives for the company to set in place systems and procedures to minimize the vulnerability of the system to disaster. Regulators will have to closely supervise the arrangements that operators make with insurers, especially in cost-plus type environments.

The weakness of the Sri Lankan licence conditions shows the value of creating general rules regarding disaster-preparedness. General rules applicable to all operators are more appropriate for a competitive environment. Of course, proper disaster management and telecom expertise would have to be applied to the design of these rules. The regulatory agency and policy makers should, however, be aware of the danger of too many escape clauses being inserted into the rules by operator representatives, as can be seen from the Sri Lankan licences.

Disaster recovery takes short- and long-term forms. The short-term solutions lie in the making and implementation of effective contingency plans. The Sri Lankan study found that a declaration of a state of disaster (as is found in the US) is a very useful mechanism for triggering exceptional responses on the part of the operator, the regulatory agency, and other parties. A clearly demarcated ‘period of exception’ would allow quick and flexible responses without having to abandon normal procedural safeguards across the board, thereby minimizing damage to the investment climate.

Sri Lanka’s experience showed the value of redundancy, especially in under-developed countries: where one network failed, a competi-
Disaster-preparedness and recovery

The Sri Lankan pilot study does not directly highlight are the special advantages and challenges of truly disaster-resistant infrastructure supply. Satellite-based telephone service or GMPCS (Global Mobile Personal Communication by Satellite) is a classic example of a disaster-resistant (except for energy replenishment) infrastructure. Except in the few countries that host the ground stations, the entire infrastructure sits high above the earth and is impervious to most forms of disasters. This service has lost much of its lustre due to the bankruptcies of Iridium and ICO. However, it is still worthwhile for regulatory and disaster management agencies to explore the possibilities of incorporating this technology in their disaster manage-
ment plans especially in the light of the emergence of more tightly focused GMPCS operators after the industry’s reorganization.

In the course of a public-notice proceeding it conducted on GMPCS licensing, the TRCSL faced objections from the recently privatized incumbent that any grant of a GMPCS licence would violate its ‘monopoly’ over international telephone services. The actual language of the privatization agreement, also incorporated into the licence, was that ‘no other license . . . for the provision of international telephonic services in and from Sri Lanka prior to 5 August 2002.’ The final decision of the commission held that GMPCS services that did not involve the use of earth stations in Sri Lanka did not require system licenses under Sri Lankan law (TRCSL 1999c). Objections such as those raised by the Sri Lankan incumbent neglect the broader social ramifications of introducing competing and socially beneficent technologies, in their shortsighted preoccupation with ambiguous exclusivities. While the Telecom Regulatory Commission found no grounds for these objections in the course of the multi-round public proceeding conducted in 1998/99, it appears that implementation of the announced progressive policy on GMPCS has been stalled since 2000.

Conclusion

A comprehensive view of regulation under liberalization should include a focus on disaster-preparedness and recovery. This is important not only for its intrinsic importance, but also for enhancing the stable conditions necessary for investment and because of its contribution to building the legitimacy of the regulatory process. This paper has highlighted several important lessons that may be learned from examination of the theory and practice of regulation related to disaster-preparedness and recovery. More regulatory resources must be devoted to this subject, but a pre-condition is the recognition by the knowledge communities in the field of telecom policy and regulation that the subject is an important one.

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Introduction

The outcome of the Fourth Session of the WTO (World Trade Organisation) Ministerial Conference at Doha, 9–13 November 2001, has been a mixed bag. On a balance, however, it seemed to have achieved more than anticipated gains for India in select critical and contentious areas.

In the period preceding the Ministerial Conference, generally opposing views on issues to be included in the agenda for negotiations were discernible. Whilst the DMD (Draft Ministerial Declaration) that aimed at charting the immediate agenda for negotiation at the Ministerial Conference did not explicitly mention a new round of trade negotiations, it covered all the issues that clearly pointed towards a broad-based agenda being imminent. India and some other developing countries continued to oppose the launch of a new round. They stressed the resolution of commitments made under the Uruguay Round before an expansion of the scope of multilateral trade negotiations to include other issues, such as investment, competition policy, transparency in government procurement, trade facilitation, labour, and environment. On the other hand, developed countries, particularly the United States and the EU (European Union) strongly favoured the launch of a new round of trade negotiations that would address these issues.

The focus of this paper is on a pre- and post-Doha analysis of what India set out to achieve for itself and its successes and failures. Further, the paper attempts to outline pragmatically some directions for the future.

The Road to Doha

Draft Ministerial Declaration and India’s concerns therein

The DMD circulated prior to the ministerial conference began with the positive note of continuing the process of reform and liberalization of
trade policies. It pledged to reject the use of protectionist measures so as to attain the ultimate aim of poverty alleviation through increased opportunities and welfare gains. For this, it placed the interests of developing and least developed countries at the centre of the multilateral trading system. However, the manner in which issues of inclusion of trade and environment, concerns of market access and intellectual property rights, and implementation of commitments made under the Uruguay Round were dealt with was not satisfactory from India’s viewpoint. Furthermore, proposals to expand the scope of negotiations to include investments, competition, trade facilitation, and transparency in government procurement also continued to be disquieting. Each of these issues is discussed below.

Trade and environment issues
The DMD affirmed that the pursuit of an open and non-discriminatory multilateral trading system and environmental protection are mutually supportive objectives. The emphasis on finding ‘win-win’ solutions was clear in the draft declaration, which recommended that the CTE (Committee on Trade and Environment) particularly examine those situations where elimination or reduction of trade restrictions or distortions would benefit trade, environment, and development.

India, while reiterating its commitment to environmental protection, has been traditionally opposed to legitimizing the imposition of unilateral trade restrictive measures through an expansion of the scope of multilateral negotiations to include environmental issues and the consequent dilution of the role of the CTE (WTO 1999). As part of his address to the Fourth Session of the WTO Ministerial Conference at Doha, the Commerce Minister, Mr Murasoli Maran, stated that India is ‘...strongly opposed to the use of environmental measures for protectionist purposes and to imposition of unilateral trade-restrictive measures. ... the existing WTO rules are adequate to deal with all legitimate environmental concerns. We should strongly resist negotiations in this area which are not desirable, ...’ (WTO 2001). This aside, India has been opposed to negotiations on the relationships between the WTO and MEAs (multilateral environment agreements) and issues of eco-labelling. In particular, a note of caution might be expressed in respect of the statement within the DMD to link the work of the Committee on Technical Barriers to Trade to expedite work on eco-labelling.

Developed countries, on the other hand, submitted proposals to the WTO seeking a broadening of the mandate of negotiations to include environmental issues. The EU, for example, sought to
‘mainstream’ environmental issues by making trade measures in MEAs and eco-labelling requirements (including those based on non-product related PPMs [production processes and methods]) compatible with WTO principles. The EU also favoured negotiations on environment-related issues in light of concerns of its civil society. The US and the CAIRNS Group countries demanded removal of environmentally damaging subsidies, including agricultural and fishery sector subsidies. Another group of developed countries took recourse to further discussion on the ‘precautionary principle’ and the need to develop a common understanding of how to manage risks in situations where there was scientific uncertainty with regard to impacts on human health and the environment.

WTO and MEAs
It is accepted in principle that the preferred approach for the national governments to tackle transboundary or global environmental problems is through cooperative, multilateral action under the MEA. This is well recognized in the discussions in the WTO as well. In line with this, a priority area identified by the DMD was an increased understanding of the relationship between the multilateral trading system and the MEA. Under the DMD, it was agreed to negotiate to enhance the mutual supportiveness of trade and environment, specifically on

- the relationship between existing WTO rules and specific trade obligations set out in the MEAs. This is, however, applicable only to parties to the MEA in question;
- procedures for regular information exchange between the MEA secretariats and the relevant WTO committees, and the criteria for granting the observer status; and
- the reduction or elimination of tariff and non-tariff barriers to environmental goods and services

As provided in Agenda 21, international trade and environmental laws should be mutually supportive. The relationship between the WTO and trade provisions of MEAs provides the greatest challenge to this provision. Out of the 200 or so MEAs currently in existence, 20 contain trade measures to achieve their goals. This implies that the MEAs use trade restraints in a particular substance or product, either between parties to the treaty or between parties and non-parties, or both.

The major MEAs with trade provisions, that India is a signatory to, are the Montreal Protocol on Substances that Deplete the Ozone Layer, the Basel Convention on the Transboundary Movement of Hazardous Wastes, and the CITES (Convention on International Trade in Endangered Species).
The GATT (General Agreement on Trade and Tariffs) / WTO members are obliged to observe the MFN (most-favoured nation) clause, the principle of non-discrimination and NT (national treatment) principles and the provisions on eliminating quantitative restrictions (Articles I, III, and XI). Any MEA provision that states that parties can use trade restrictions against some countries (the non-parties), but not against others (the member parties), may violate all these three Articles, a key concern in harmonizing the principles of the multilateral trading system and the provisions in the MEAs. It also discriminates between otherwise ‘like’ products based on their country of origin, imposes quantitative restrictions, and it may treat imported goods differently from ‘like’ domestic goods—violating the MFN clause and the NT clause by allowing discrimination between domestic and imported products.

The information sessions organized by the CTE with the secretariats of the MEAs have noted that the focus is on developing mechanisms to assist parties to comply with the obligations in a flexible and non-confrontationist manner.

Modifications of the WTO trade rules to accommodate the trade provisions in the MEAs, if approved, are of concern to countries such as ours on account of the following aspects. First, changes in the WTO rules could have a damaging effect on the trade promotion opportunities of developing countries as most of them export natural resource-based products. Second, trade measures to attain environmental goals can only be second-best policy moves, when environmental degradation arises from policy or market failure. That is, the inclusion of trade-restrictive measures for non-trade purposes is economically inefficient. Third, broadening the scope of exceptions in Article XX would make it ever more difficult to successfully challenge a trade measure under this Article. Such modifications, on environmental grounds, may also eventually spill over to other areas, such as labour issues and human rights. Finally, there is little progress in respect of supportive measures from developed countries, in the form of enhanced access to markets for products from developing countries and access to ESTs (environmentally sound technologies), finance, and capacity building to enable compliance with the MEAs. The emphasis on the use of trade measures over other policy instruments could further discourage the search for positive measures.

In this context, India’s view has been that the current WTO rules and practices are sufficient to address any contradiction that may arise between WTO rules and trade measures in MEAs. In the case of local environmental effects, the position taken has been that unilateral trade measures based on non-product-related PPMs are tanta-
mount to enforcing domestic environmental regulation on the trading partner, which is not acceptable. Insofar as environmental externality has transboundary spillover effects, the use of trade measures pursuant to MEAs should not imply coercing countries to join an MEA. Instead, addressing global environmental problems cooperatively, based on common but differentiated responsibility, has been repeatedly emphasized.

The other concern for developing countries with regard to MEAs is the high costs of compliance with their provisions. For instance, India is a signatory to the Montreal Protocol, which commits signatories to gradually phase out the consumption of certain CFCs (chlorofluorocarbons), halons, and other substances (‘controlled substances’) that deplete the earth’s ozone layer. The Protocol also includes trade measures between parties, and among parties and non-parties. These trade provisions commit signatories to ban the import and export of controlled substances from non-parties and also ban the import of products containing controlled substances from non-parties.

These requirements have imposed incremental costs of compliance on signatories, especially the developing countries. In India, a number of small-scale units in such industries such as refrigeration, fire extinguishers, pesticides and pharmaceuticals have been affected. The cost of adjustment and conforming to international standards has been assessed to be 1400 million dollars for an early phase-out and 2450 million dollars for a late phase-out (Jha, Hewison, and Underhill 1997). The relationship between existing WTO rules and specific trade obligations set out in the MEAs is mandated for negotiations. The CT E is to prepare a report on environment issues to be negotiated at the fifth session of the ministerial meeting.

Environmental requirements

The concern regarding a rise in ‘green protectionism’ is heightened as the DMD recognizes ‘the right of members under the multilateral trade rules to uphold and enforce the levels of health, safety and environmental protection they deem appropriate, including the right to regulate and to introduce new regulations on the supply of services’. This is followed by a proviso that measures taken to address such concerns shall not be used for protectionist purposes.

By explicitly recognizing the rights of member nations to impose regulations for the protection of environment, health, and safety, the declaration opens the door for an increase in unilateral imposition of standards and technical regulations, packaging, labelling and recycling requirements, and environmental charges and taxes. The spe-
specific agreements in the WTO under which countries can impose such measures are the TBT (Technical Barriers to Trade) Agreement and the SPS (Sanitary and Phytosanitary) measures Agreement. The former allows members, on the basis of the least trade restrictiveness test, to apply mandatory and voluntary standards for the protection of human health, animal or plant life and the environment. The latter, which conforms to the ‘precautionary principle’ adopted by the WTO, encourages the use of protective measures to guard against damage to the environment, plant or human health.

Apart from these, there have been selective bans imposed by the advanced nations based on environmental requirements. For example, the EU has imposed bans on Indian seafood exports on account of infrastructure and hygiene in fishery establishments. In fact, the requisites outlined for the setting up of an EU-approved plant far exceeds the ones set by the HACCP ( Hazard Analysis Critical Control Point), which is the preferable system for food safety. This is an example of de facto non-tariff barriers against industries in developing countries and call for action by the WTO to prevent the imposition of such unilateral measures.

Eco-labelling, which are voluntary standards entailing labelling of products according to environmental criteria, could range from product contents to environmental externalities arising in the entire lifecycle of a product, from production to consumption. The use of the life cycle approach results in differentiation between products on the basis of environmental externalities in PPMs. Handling requirements for products that specify packaging, recycling, reuse, recovery, and disposal are also used as environmental policy measures by some countries.

Standards based on non-product-related PPMs and eco-labelling requirements do not take into account the differing levels of environmental abundance (and hence the ability to absorb pollution), technological or economic development, important factors that would determine the type of production process adopted. To make matters worse, labelling requirements could differ between export destinations, which could cause further difficulty in compliance. Export sectors, such as forest products, leather goods, and textiles are especially threatened.

For India and other developing countries, the concerns with regard to such environmental requirements are threefold. First, these environmental regulations could be used as non-tariff barriers to trade, thereby limiting market access for their export products. This has been the case with Indian tea exports, which were banned by some European countries on account of high pesticide residue levels.
Second, the technical and financial capacity of firms in developing countries, especially small- and medium-sized enterprises, to conform to environmental regulations set by developed countries is limited, thus leading to a disproportionate burden of costs across different categories of producers. This has been the case with the dye sector in India, where the industry is dominated by small- and marginal-sized enterprises. Germany has stipulated the usage of the environmentally friendly Busan-30 instead of the regular PCP (pentachlorophenol) in dyes used in cotton fabrics. However, shifting to the specified dye would entail costs nearly thirty times that of PCP, thus proving prohibitive for the Indian industry. Yet another example of the increased costs of compliance with eco-labelling schemes is the footwear sector where these costs were found to be nearly 33% of the export price. These measures result in a loss of competitiveness, market access, and export revenues, and further serve to limit developing countries' ability to implement improved environmental standards.

Third, in the case of local environmental effects, using the same standard across countries, or even different regions within a country, may be wholly inappropriate. Such standards would be more effective and efficient if they took cognizance of specific environment and development conditions.

The other area of concern has been regarding market access barriers created on account of non-product-related PPMs, which have had little transboundary effects. Indian shrimp exports have been losing heavily because of the unilateral restrictions imposed on account of the harvest of shrimp without using turtle excluder devices. The WTO clearly rules against such camouflaged trade barriers. However, with the explicit mention of the inclusion of environment concerns in the DMD, doubts prevailed on the stance of the WTO.

**Market access**

The DMD agreed to reduce or eliminate tariffs, including the reduction or elimination of tariff peaks and tariff escalation and non-tariff barriers for non-agricultural products. Product coverage was envisaged to be comprehensive and without a priori exclusions. The DMD also noted that the negotiations shall take into account the special needs and concerns of developing countries, including through less than full reciprocity in reduction commitments. From the Indian viewpoint, the important areas of concern included implications of the Agreement on Agriculture on national food security and rural employment safeguards as well as reduced ‘market access’ entailed by high subsidies and high tariff walls maintained by developed countries on account of non-fulfilment of the commitments made under
the Agreement on Textiles and Clothing and the Agriculture Agreement.

On the issue of market access for agricultural products, the Draft Declaration merely states that the future work programme on the directions or aims of reforms in the areas of market access, domestic support and export competition is to be elaborated through consultations. A crucial area of interest to developing countries thus remains largely unaddressed.

In particular, the lack of progress on increasing market access for agriculture products is a serious concern for India and other developing countries as it is in these products that they have comparative advantage. Even after six years of implementation of the Agreement on Agriculture, the access for products from developing countries continues to be impeded in developed country markets due to their high trade distorting domestic support policies coupled with tariff peaks, tariff escalation and a plethora of non-tariff barriers (WTO 2000). In certain product categories, particularly in processed products, the level of tariff escalation has almost doubled in comparison with the level of tariff that existed prior to the Uruguay Round. Tariff escalation has an inherent bias towards the export of primary and unprocessed products—textiles, clothing, leather, rubber footwear, a majority of which have export interests for developing countries, thereby limiting market access.

Trade liberalization also incorporates the removal of trade distorting subsidies, including environmentally harmful subsidies such as those in the energy and agriculture sectors. The concern for India is the social dimensions of the removal of these subsidies, as from a developing country perspective, subsidies are a crucial means of providing access and security to disadvantaged sections of the population.

On the issue of subsidies, the Agriculture Agreement and Subsidies and Countervailing Measures make certain exemptions for environment subsidies (or domestic support). Under the Agriculture Agreement, a distinction has been made between those subsidies that are exempt from commitments towards reducing domestic support, on grounds of non-trade effects (e.g. research, disease control, food security, and environment) and those that are not (as they have production and hence trade implications). However, this distinction is usually not very clear. Similarly, under the Subsidies and Countervailing Measures, the provisions with regard to non-actionable subsidies, granted on grounds of industrial research, pre-competitive development activity, assistance to disadvantaged regions, or assistance for adapting to new environmental laws or regulations can-
not be challenged in the WTO's dispute settlement procedure, and countervailing duty cannot be used on subsidized imports. To qualify for these exemptions, however, the subsidies have to meet strict requirements.

**Intellectual property rights and the Trade Related Aspects of IPRs Agreement**

The priority areas for negotiations under the TRIPS agreement that emerged at the agenda for discussions at the Fourth Session of the Ministerial Conference were the negotiations on geographical indications, clarifying the relationship between the WTO's TRIPs Agreement, and the United Nations CBD (Convention on Biological Diversity). Specifically, India, among other developing countries, called upon the WTO to consider and address the implications of the TRIPS Agreement on national public health policies. India's concerns and positions on these areas are discussed below.

**Geographical indications**

A geographical indication refers to the use of a place name to describe a product, which usually identifies both the product's geographical origin and its characteristics. Products such as 'Scotch' whisky, 'Champagne', 'Tequila', and 'Roquefort' fall in this category. At present, protection of geographical indications exists predominantly for wines and spirits, products mostly from developed countries. The Draft Declaration strengthens the protection offered to these products by agreeing to complete negotiations on the establishment of a multilateral system of notification and the registration of geographical indications for wines and spirits.

Developing countries including India have been calling for the extension of the protection of geographical indications to products beyond wines and spirits to other products including handicrafts, agricultural products, and other beverages. This concern has not been concretely incorporated in the Draft Declaration as it just states that the Council for Trade-Related Aspects of Intellectual Property TRIPS shall examine issues related to possible negotiations on the extension of the protection of geographical indications to additional product areas.

Extending the protection offered by geographical indications would be critical to maintaining a competitive advantage in export products such as Alphonso mangoes, Basmati Rice, and Darjeeling Tea by instilling a degree of product differentiation. In this respect, a sui generis legislation for the Protection of Geographical Indications of Goods (Registration and Protection) Bill has been passed in India.
in December 1999, which may serve as the basis for seeking higher protection for some products.

**TRIPS and public health**

In preparations towards Doha, members negotiated on clarifying the relationship between intellectual property protection and access to medicines and public health. Intellectual property protection was deemed necessary for encouraging creation of new medicines. For one, the clarification of relationship between TRIPS and public health in the DMD text aimed at reducing uncertainties about using the flexibility provisions (such as compulsory licensing and parallel imports) of the TRIPS Agreement. At the other end, the TRIPS Agreement could potentially have detrimental implications for access to drugs in developing countries, particularly their poorer populations, to deal with large-scale, life-threatening epidemics such as HIV/AIDS, malaria, tuberculosis, and other diseases.

India, as of now, provides only process patents to the pharmaceuticals sector and hence it is possible to produce a given drug at a cheaper cost by producing it with a different process. India has to meet commitments on the TRIPS Agreement by 2005. With the imposition of product patents, a high-cost structure of drugs could emerge, which has serious implications for the access to medicines.

In June 2001, India along with other developing countries submitted to the Council for TRIPS that measures be taken to ensure that the TRIPS Agreement does not undermine the right of WTO members to formulate their own public health policies and implement them by adopting measures to protect public health. The submission to the TRIPS Council argued that the protection of intellectual property rights, in particular patent protection, should encourage the development of new medicines and the international transfer of technology to promote the development of manufacturing capacities of pharmaceuticals, without restraining policies on access to medications. This concern, however, has not been incorporated in the agenda set out for the TRIPS Council by the DMD.

**TRIPS and CBD**

The TRIPS Council was also envisaged to address the relationship between the TRIPS Agreement and the CBD and the protection of traditional knowledge and new technological developments. This is on account of a possible conflict in the objectives of the two agreements.

The CBD provides a basis for the equitable access to natural resources, while focusing on conservation, sustainable use and equita-
ble sharing of benefits from the utilization of these resources, and respect for local communities' knowledge and innovations. The TRIPS Agreement seeks to promote and foster technological innovation by ensuring the certainty of intellectual property protection, but it is not clear how this protection can achieve the objectives of sustainable development, benefit sharing, and conservation of biodiversity especially in developing countries.

It becomes evident that both the agreements approach the issue of IPRs from different perspectives. However, it is possible to trace certain synergies that would enable the building of a mutually supportive relationship so as to achieve the common objective of sustainable use of intellectual property. One such move would be the introduction of TRIPS-compatible IPR systems wherein IPRs are shared along with other mutually agreed access to genetic resources. The second would be to disclose informal knowledge regarding patents while yet another move would be the coming together of the CBD and the TRIPS for the exchange of IPR-related material.

In addition to the issue of protecting traditional knowledge where the CBD and the TRIPS Agreement seem to be in divergence, the TRIPS Agreement has significant trade and environment implications. This is reflected in the agenda of the CTE, which includes, as a focal point of discussion, the issue of IPRs as engendered in the provisions of TRIPS. The environmental aspect of provisions in the TRIPS Agreement is clearly manifested in Article 27, which states that members may exclude from patentability inventions, which are necessary ‘...to protect human, animal or plant life, or health, or to avoid serious prejudice to the environment...’.

The ruling on IPRs through TRIPS and the various provisions regarding standardization norms are expected to have tremendous impact on trade especially in the conduct of trade and in the patterns of trade flow. This is so because these provisions tend to significantly alter market access: a patent granted to a specific country would act as an indirect barrier to trade to those countries which were previously engaged in the trade of that particular good. This kind of an adverse impact could affect developing countries more than advanced nations.

**Implementation issues**

As the run up to the ministerial meeting, a gamut of issues relating to implementation of the Uruguay Round agreements attracted maximum attention and generated more debate than any other area of work of the WTO. From the developing country perspective, including India, the main concerns have been the following. First, capacity
constraints have hindered full-fledged implementation of the Uruguay agreements, namely lack of financial, human, and institutional resources that often make it difficult to operationalize the agreements in the context of developing countries. Second, the agreements have not brought forth the economic benefits that were envisaged particularly in respect of the agreements on textiles, subsidies, agriculture, IPRs, anti-dumping, SPS measures and that there is need for ‘re-balancing’.

The concerns expressed by India inter alia pertained to imbalances in the earlier Round, non-realization of expected benefits, and non-binding character of special and differential provisions applicable to developing countries. The distinctive areas included: Agreement on Textiles and Clothing under which meaningful access has not accrued to the developing countries, prevalence of anti-dumping measures in the EU that posed hardships for Indian textiles exports and absence of honouring the provisions in Agreements on SPS measures and TBT in application of special and differential treatment. Additional implementation issues highlighted by India relate to imposition of unilateral trade restrictions, growing emergence of regional trading arrangements, market access to agricultural products, issues of transfer of technology at fair and affordable costs in the context of trade and environment, etc. Hence, India’s position in preparing the Ministerial Meeting was resolution of these concerns to constitute an important part of the agenda of the meeting.

Investment, competition, trade facilitation and transparency in government procurement

On the group of four issues covering trade and cross-border investment, trade and competition policy, trade facilitation and transparency in government procurement, the DMD proposed agreements to begin multilateral negotiations with a view to encouraging their contribution to international trade and development, whilst securing transparency, predictability and stability of rules and procedures.

Like other developing countries, India has thus far participated in the educative process to gain a thorough understanding of the issues before assessing as to whether it would be in its interest to enter into multilateral trade agreements. Although acknowledging the spirit of launching negotiations on these subjects, India held the position that there was lack of ‘...consensus in favour of changing the study mode into negotiation mode in respect of any of these subject’ (Third World Network 2001). The only option offered by the DMD was proposal to commence negotiations, which was at complete variance to earlier
commitments made in Singapore that entailed no pressure to be put on countries to negotiate rules until there was ‘explicit consensus’.

**India at Doha**

With the above background, we now undertake an analysis of the specific outcomes at Doha on each of the issues of concern for India. The objective is to assess the gains made, particularly under the TRIPS Agreement and in the area of agriculture and examine the concerns as a result of mainstreaming of environmental issues into the WTO framework. We also address the implications for India as a result of developments at Doha in addressing implementation issues, investment, competition, and transparency in government procurement and trade facilitation.

**Trade and environment**

India's vehement opposition to the inclusion of environment in the WTO framework could not stop its mainstreaming into the multilateral trading system. The Doha Declaration recognizes the right of countries to take measures for environmental and health protection, with the caveat that these measures should not be used as protectionist devices that hinder trade flows. This sanctioning of unilateral imposition of environmental measures is a worrying development for India.

In the aftermath of Doha, the CTE would be examining the issue of imposition of labelling requirements for environmental purposes. Based on the recommendations of the CTE, negotiations could take place on this subject at the next ministerial conference in 2003. This would open the door for the imposition of eco-labels and other environmental requirements which would increase costs for domestic industry, particularly small enterprises which would have to comply with these requirements to remain competitive. Environmental requirements have been criticized not only for the potential for them to be used as non-tariff barriers but also for the way in which they are formed, which do not take into account differing environmental resource bases, and social and economic conditions among countries. To address some of these concerns, the effect of environmental measures on market access with particular reference to developing countries is to be studied by the CTE and, based on this, action will be taken at the next ministerial meeting. This small window of opportunity should be utilized by India to undertake a concrete assessment of the implications of environmental requirements on trade flows and present these findings to the WTO, so as to restrict the adverse affects of imposition of these requirements.
In its opposition to the linking of trade and environment, India had also said that existing WTO rules were adequate to deal with all environmental concerns. This view also did not find reflection in the Doha Declaration that calls for negotiations on the relationship between existing WTO rules and trade obligations in MEAs. However, the negotiations would be limited to the applicability of WTO rules among parties to an MEA. Thus the core issue of reconciling the imposition of more stringent trade measures on countries that are not parties to an MEA but are members of the WTO, with the principles of non-discrimination and MFN, remains unresolved.

At this point, it is necessary to emphasize that India’s opposition to the inclusion of environment in the multilateral trading framework should not be interpreted as meaning that addressing environmental concerns is not high on the priority of the government or the people. The objective of environmental protection is enshrined not only in the Constitution of India and implemented through various policies, programmes, and legislation, but has been part of traditional community practices. India is committed to achieving sustainable development and is a signatory to the Marrakesh Declaration, which sets this as the overall objective. The Doha Ministerial Declaration also reaffirms commitment to the objective of sustainable development, and emphasizes that the objectives of safeguarding an open and non-discriminatory multilateral trading system and environmental protection are mutually supportive. There can be no disputing these basic principles and objectives, it is their translation into unilateral trade restrictive measures that is to be opposed.

**Market access with specific reference to agriculture**

In the arena of agricultural trade, India had been calling for the elimination of domestic support, trade distorting subsidies, and non-tariff barriers that prevent the free flow of agricultural exports from developing countries. Along with this, India emphasized the critical dependence on agriculture of large rural populations in developing countries, and the ‘need to adequately provide for their food and livelihood security and for promoting rural development’ (WTO 2001).

In the Doha Declaration, WTO members have committed to comprehensive negotiations aimed at increasing market access, reducing and eventually phasing out export subsidies and substantial reductions in trade distorting domestic support policies. Getting this commitment from developed nations, particularly those that form the EU, which were opposed to reducing domestic farm support, has been seen as a major negotiating gain for India and other developing countries. Further, the Doha Declaration specifies that special and
differential treatment would be accorded to developing countries for the implementation of commitments to trade liberalization in the agriculture sector. Significantly, the Declaration explicitly states that this differential treatment in implementation should enable developing countries to address their development needs, such as food security and rural development. The incorporation of these issues in the ‘green box’ is a substantial gain for India.

The TRIPS Agreement

Public health

The impending imposition of product patents under the TRIPS Agreement would result in increased prices of many drugs and medicines, in addition to having adverse impacts on the domestic pharmaceutical industry. At Doha, India asserted that ‘availability and affordability of essential medicines is a universal human right. WTO should not deny that right’ (WTO 2001). Further, a demand was made that the Ministerial Conference should send out a message that the TRIPS Agreement should be interpreted and implemented in a manner supportive of the WTO Members’ right to protect public health and ensure access to medicines to all.

The adoption of the Declaration on the TRIPS Agreement and Public Health at Doha is thus a substantive gain for India and other developing countries who had been pressing for this. The Declaration recognizes developing country concerns about ensuring access to medicines and taking measures to protect the health of its citizens. Countries now have the flexibility of determining what constitutes a public health emergency, including diseases such as HIV/AIDS, tuberculosis, malaria, and other epidemics. The government can then grant compulsory licenses to pharmaceutical companies to produce drugs and medicines for alleviating the particular health emergency. Thus, the restriction on production of patented drugs and medicines could be sidestepped if required and deemed necessary by the government. This could go a long way in ensuring availability of medicines to a large segment of the population.

Geographical indications

Another area of concern for India under the TRIPS Agreement is the issue of protection through GI (Geographical Indications) for products such as Basmati Rice, Darjeeling Tea, Coorg Coffee, and Alphonso Mangoes, which are produced in specific regions in India. The need for such protection was only recognized for products such as wines and spirits, where developed countries have a comparative advantage. In the run-up to the Ministerial Conference, developing
countries including India had been calling for the rectification of this distortion.

The Doha Declaration addresses their concern, but in a limited manner. While it formalizes the system of protection for wines and spirits by agreeing to negotiations on the establishment of a multilateral system of notification and registration for these products, it stipulates that further study be undertaken on the issues relating to extension of GI protection to other products. The Council for TRIPS would undertake this in its work programme and based on its findings, a decision would be taken at the next ministerial conference in 2003 on whether negotiations should be entered into, thus deferring the flow of benefits from such protection.

TRIPS and CBD

Underlying the specific concern about the extension of protection by GI, is the more fundamental issue about the potential conflict between the TRIPS Agreement and the CBD (Convention on Biological Diversity). While TRIPS seeks to provide protection to private property (an individual or firm’s right of ownership of distribution of a process/product developed by them), the CBD aims to promote the conservation of biological diversity using measures such as the adoption of traditional knowledge on the subject, which by its very nature is common property. Thus, the implementation of these two multilateral agreements, which India is signatory to, could be in conflict.

The protection of traditional knowledge and products or processes that emanate from it is something that India and other developing countries have been calling for. The need for this protection has arisen on the basis of several instances of misappropriation of the biological and genetic resource of developing countries. The Doha Declaration recognizes this concern and calls for further work on examining the relationship between the TRIPS, CBD, and the protection of traditional knowledge and folklore. This could be utilized by India to strengthen the case for protecting products that have been developed using traditional knowledge.

Implementation issues

The cornerstone of India’s approach to the Doha Ministerial Conference was the insistence that negotiations be limited to those already mandated, such as agriculture and services, and implementation of commitments made in the earlier Uruguay Round agreements. At Doha, India reiterated this and drew attention to the ‘asymmetries and imbalances in the Uruguay Round Agreements, non-realization of anticipated benefits and non-operational and non-binding nature of special and differential provisions’ (WTO 2001).
Concerns on implementation issues have been addressed in a limited manner by the Doha Declaration, as only some of the issues have been mandated for immediate negotiation. Other outstanding implementation issues have been recommended for further study and action will be taken only at the next ministerial conference in 2003.

**Investment, competition, transparency in government procurement and trade facilitation**

India had been strongly opposed to the inclusion of new issues in the agenda of multilateral trade negotiations at Doha, on the basis that these were essentially non-trade issues that would curtail the governments’ right to develop economic and industrial policies for national development. At any rate, it called for the need to study these issues before entering into a process of negotiations, which also should be undertaken only after an explicit consensus. India stuck to this stance and said that it would not sign the final declaration until this was specifically incorporated. This call was addressed, with the Doha Declaration specifying that negotiations on these issues be deferred to the next session of the ministerial conference and only with the explicit consensus of member countries. This gives India and other developing countries time to examine the implications of undertaking any commitments in these areas on domestic policies.

**Directions**

India had a significant role to play in shaping the outcome of the Doha Ministerial Conference, particularly considering its small share in world trade. The rigid approach adopted by India ran the risk of getting isolated in the international arena although ex post the risk-taking strategy paid off well.

Against this background, it would be right to state that more than anticipated gains have been made at Doha on several issues of concern for India. For one, these include getting a fair visibility for its concerns in the deliberations at the ministerial meet as much as the run up to it. By virtue of this, a range of developing country concerns were internalized into the future work programme of the WTO. Specifically, these include commitments towards ensuring availability and affordability of essential drugs and medicines, protection of niche indigenous products and market access for farm exports. The area of concern is the inclusion of environmental issues into the multilateral trading framework and the consequent potential for a rise in non-tariff barriers.

India’s strategy for the next ministerial conference should be to adopt a proactive and pragmatic stance towards trade negotiations and not one that would isolate it from the bulk of the trading commu-
Trade reforms are here to stay. Towards this, it would be in India’s interest to be well prepared, through comprehensive research and analysis on the implications of commitments in specific areas to participate effectively in the future negotiations. Whilst guarding ourselves of the costs entailed, it would be only correct to weigh these against the benefits that would accrue by integrating ourselves with the international trading system such as capital and technology inflows, skill enhancement, and competitiveness. Reconciling domestic policy objectives with the demands placed by the global economic environment is the need of the hour. The process of trade liberalization is an opportunity for India to deepen economic reforms towards integration with the global economy.

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