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INDIAN ECONOMIC POLICY – SOME ISSUES

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Planning Models to Policy Engineering:

As economists we have come a long way. In the early days of planning, allocation of resources seemed to be the most important intellectual problem, planning commission's various Five Year Plans and the publications of the perspective planning division, also planning commission (1984). The planning models of the 1950s and 1960s addressed this question. Optimal allocation seemed to be insufficient to realize the plan targets. The need to define policies that can lead to the targets became obvious. Thus the optimal control models are the pioneering effort in India.

Behind these approaches was the belief that government is powerful and knowledgeable. It knows enough and that it can realize whatever targets it sets. However we soon realized that particularly in a mixed economy such as ours, the reactions of millions of economic agents to government policy could affect the outcome of policy. In fact the outcome may even be perverse. The need to incorporate the behavioral responses of economic agents in analytical models became obvious. This led to computable general equilibrium modeling in the 1970s. Soon however, it was felt that with a general equilibrium model you could get any result that you want by a suitable choice of parameters. Of course the choice of parameters is not the modeler's prerogative. The parameters have to describe the economy under consideration. Thus emphasis shifted to what some people call applied or empirical general equilibrium models (Narayana, Parikh and Srinivasan, 1991).

The policy insights obtained from such models were richer and more credible. Yet these were not acceptable to politicians. The trouble was with the political economy of the situations. For the political economy of India's development experience see Kelegama and Parikh (2003). Vested interests made these policy suggestions seem too theoretical, impracticable or irrelevant. What we need is to incorporate the political economy dimension in the empirical general equilibrium modeling framework. This I call a descriptive general equilibrium model. What would this involve?

We will need to have many more actors including groups of people. We will need to recognize the multiple objectives of economic agents. Collective action groups or political pressure groups will have to be modeled. The outcome of the political market place in terms of choice of policy will have to be endogenized. Transaction costs and costs of collective action

will need to be included. We will need to make models dynamic with uncertainty / and expectations. This may seem a tall order but considering how far we have come it is not beyond attainment. If physicists can hope to have a theory of everything, economists should aspire to a theory of everyone.

While constructing such a descriptive general equilibrium model may take time, we can be pragmatic and proceed in partial equilibrium approach but with this larger framework in mind. We can look at a problem from the perspective of various stakeholders, integrate them and design policies that are acceptable to as many stakeholders as possible. This I call policy engineering and describe some examples.

Would such an approach lead to a solution that is acceptable to all? It is not always that one can find a win-win solution. One can however clarify whose interests are not guarded and often one does not want to protect all interests. In fact policy reform involves some loss of money or power for some group or other. Making these transparent and protecting the interest of innocent bystanders will be of value.

I turn now to some examples of policy engineering.

Reforming Fertilizer Subsidy:

This work was done as a part of the work of Expenditure Reforms Commission (2000).

The Problem:

Then we looked at it fertilizer subsidies had grown rapidly from Rs.4,389crores in 1990-91 to Rs.13,250crores for 1999-2000 as per the budget estimate and was likely to be higher. The Finance Minister had very little option and had to contain the growing fertilizer subsidy. In his budget, he had proposed to raise the price of Nitrogenous fertilizers by 15 percent. The farm lobby was resisting this proposal.

Fertilizer subsidy was also justified in the early years of green revolution to induce farmers to adopt the new technology. The green revolution technology is now widely accepted and the need to subsidize fertilizers to induce farmers to increase their usage has gone down. Fertilizer subsidy was justified in the past also because output prices were kept low for providing

cheaper food to consumers. That way, farmers' incentives to use fertilizer and increase output was not adversely affected. It would thus seem that if we were to raise fertilizer price and compensate the farmers by higher procurement price for their output, production would not be affected and they should not mind.

There is, however, a problem. Many small farmers are subsistence farmers and have a very small marketable surplus. Higher output price is of much less relevance for them and higher fertilizer price would indeed reduce their real income. This can explain why some Chief Ministers resist the increase in fertilizer price.

The problem thus is how to reduce fertilizer subsidy without hurting the farmers.

Reducing the price of fertilizer paid to producers could also reduce fertilizer subsidy expenditure. At present, the government administers a Retention Price Scheme (RPS) under which price is fixed for each producer in such a way that s/he gets a 12 percent return on capital when the plant operates at 85 percent of the rated capacity. If a plant operates at a higher capacity, it would make excess profit. This has led to much gold plating of capital cost and under-rating of capacities. This is clearly reflected in the fact that many plants operate at more than 100 percent capacity. In 1998-99, 22 plants producing Nitrogenous fertilizers produced 7.74 million tonnes of fertilizer with a capacity of 6.65 million tones! In other words, they operated at 116 percent of their "rated" capacity. The champion performer was the Indo-Gulf Corporation's plant at Jagdishpur, which operated at 140 percent of its 'rated" capacity.

The retention price scheme has led to the development of a large domestic industry and near self-sufficiency. However, the unit wise RPS is a cost plus scheme. It results in high cost fertilizers, excess payments to industry and provides no incentives to be cost efficient.

Moreover, it is extremely difficult, if not impossible, to administer it without these disadvantages.

It is clear that the retention price scheme needs to be scrapped.

The objectives:

The fertilizer policy needed and still needs to be reformed. The goal of new policy should be to eventually bring fertilizer prices charged to farmers to the level of import parity price. It should protect small farmers' real incomes, should not lead to a slump in food

production and promote a balanced use of N, P and K. At the same time, the RPS needs to be dismantled and replaced by an easily enforceable system that provides incentives to manufacturers to be cost efficient, and ensures a desired level of self-sufficiency with minimal support from the government.

The stakeholders:

There were the following stakeholders. Each of them has different concerns.

1. The farmers who felt that the fertilizer subsidy was primarily for the producers. They also felt that considering that over most of the past, output prices were lower than world prices, the fertilizer subsidy actually accrued to the consumers of agricultural output.

2. The fertilizer manufacturers who argued that their higher cost compared to imported fertilizer was the outcome of high feedstock prices. The subsidy thus accrues to oil industry and not to fertilizer industry.

3. The food ministry and agricultural ministry were concerned about ensuring fertilizer supply to farmers and ensuring food security. Any change posed risks of shortage of fertilizer and that meant fall in food production. That was unacceptable to them. A sudden increase in farm gate price of urea to import parity price, without increasing procurement prices, could lead to a fall of 13.5 million tonnes of food grains production. This is thus, not a feasible option.

4. The fertilizer ministry officials who administered the retention price scheme were concerned about their power to fix prices plant by plant and one could understand their reluctance to give it up.

Protecting Small farmers:

If procurement prices were raised along with farm gate prices of fertilizers, the fall would be much smaller. However, small and marginal farmers for whom self-consumption is a large part of their output would suffer a loss in their real incomes. They should be protected. One way to do this is introduction of a dual price scheme under which all cultivator households irrespective of the amount of land cultivated by the household are given 120 kgs. (=60 kg in

nutrient terms) of fertilizers at subsidized prices. Sell the remaining fertilizer in the open market at full cost. This will provide more fertilizer than what they currently use to the poorest 50 percent of the farmers and reduce the subsidy bill by half. The fertilizer may be given in the form of coupons, which Can be traded.

In 1998-99, the total consumption of fertilizer was 16.797 million tonnes of nutrients (Nitrogen + Phosphorous + Potash). There are some 105 million cultivation households in the country and giving 60 kg of fertilizer to each household would take $105 \times 60/1000 = 6.30$ million tonnes of fertilizer. The subsidy reduction would be $100*(16.797 - 6.30) / 16.797 = 62.5$ percent or around Rs.8250 crores.

This is possible because land distribution is highly uneven. In rural India, 44 percent of the cultivators operate only 5.48 percent of the total cultivated land and 63 percent operate only 15.5 percent of the land. We also know that the farmers irrespective of their land-size use the same amount of fertilizer per hectare. Of course, the intensity differs for irrigated and un-irrigated lands and from state to state. Yet, for a given crop in given agro-climatic conditions, the intensity of fertilizer use per hectare does not vary by size of plot. The poorest 63 percent of the cultivators thus use only 15.5 percent of the fertilizer. At 60 kg per cu1ti\'ator, they will get 37.5 percent of the fertilizer. As a group they would be much better off.

In fact, the very small farmers who constitute 25 percent of cultivator households, cultivate less than 0.2 hectare of land (average size being only 0.06 hectare) will get much more fertilizer than they need, which they could sell. If they get the market price, this would be an additional income of Rs.400 per household.

If we include the 25 million landless labour households also in the fertilizer distribution and give them also 60 kg. of fertilizer, the costs would be more but the subsidy reduction would be still Rs.7000crores. But it would be the most effective anti poverty programme. It would be a progressive subsidy without any hassles of targeting. The landless labour household will get an income support of more than Rs.400 per year (compared to Rs.360 provided in the new enlarged targeted PDS-with all its targeting problems).

We should, however, also look at state-wise data for the use of fertilizer, which varies from state to state. The land distribution is uneven in all states. Thus, poorest 62 percent cultivator households operate 17.5 percent of the land in Andhra Pradesh. The corresponding

comparable figures are 56 and 12 for Bihar, 47 and 8.7 in Gujarat, 62 and 14.2 in Haryana, 51 and 9.5 in Karnataka, 61 and 22.3 in Madhya Pradesh, 61 and 18.3 in Maharashtra, 62 and 22 in Orissa, 62 and 6.2 in Punjab, 60 and 14.7 in Rajasthan, 63 and 12 in Tamil Nadu, 68 and 24.6 in Uttar Pradesh, 63 and 17.8 for West Bengal, 64 and 12 for Kerala, and 55 and 18.4 in Himachal Pradesh. Thus, 60 kg. per household would fully protect at least the poorest 50 percent of the cultivating households, and if landless labour households are also given the right to fertilizers, it would provide 70 percent of the poorest households additional income.

Another way to look at the adequacy of fertilizer per poor household is to ensure that it would be adequate to produce enough food grains for the family to subsist on. For a family of five, 850 kg of cereals per year is the subsistence requirement. 60 kg fertilizer per household would be adequate to produce this in all the major states. For example in Punjab, the average cereal yield is 3670 kg/ha and the average fertilizer use is 177 kg./ha of nutrients. At that yield rate, 0.275 ha of land should be enough to produce 850 kg. of cereals. At 177 kg/ha this requires 49 kg of nutrients, less than the 60 kg suggested here. If the farmer has a larger plot, he will need to buy additional fertilizer at the market price, but at the same time, he would have marketable surplus and he would be compensated by the higher procurement price. Thus, the suggested scheme will protect all farmers, small or large, substantially reduce fertilizer subsidy and will constitute a more effective and progressive anti-poverty measure. It would increase effective demand for food and the amount government spends on buying food grains for price support operations even with the higher procurement price to compensate for higher fertilizer price, is not likely to increase much and may even come down.

From RPS to Competitive Self-reliance:

A complete decontrol of producer price for urea would have been possible, were all our plants based on natural gas as feedstock. Unfortunately, only 56 percent of domestic capacity is gas based, 22 percent naphtha based, 9 percent fuel oil based and 12 percent is mixed feedstock based mostly naphtha and natural gas.

A sudden freeing of the urea industry could lead to most naphtha based units having to close down, as even their short run variable costs would be higher than the import price. The resultant surge in the demand for imports would push up import prices to levels which would

lead to much higher quantum of subsidy than now, if the demand is to be maintained at 21 million tonnes of urea.

Since availability of natural gas is limited, a good proportion of the production has to be based on other feedstock if a certain level of self-sufficiency is to be maintained. These plants would have to be compensated for their higher cost of feedstock.

The best possible alternative at present is imported liquefied natural gas (LNG).

In the circumstances, we recommended (ERC, 2000) the dismantling of the control system in a phased manner, leading, at the commencement of fourth stage, to a decontrolled fertilizer industry which can compete with import albeit with a small level of protection and a feedstock cost differential compensation to naphtha/LNG based units to ensure self sufficiency. The scheme envisaged is in the spirit of the recommendations of the High Power Review Committee (HPRC). The transition however has to be gradual.

The transition was to be in four phases and was to begin with the discontinuation of the RPS with effect from February 1, 2001, and introduction of a group-wise concession scheme. The phases exploit the opportunities to reduce prices for fertilizer feed stocks paid by manufacturer by freeing them to procure feed stocks from any source including import, to eliminate large inefficiencies of production reflected in the very different consumption of inputs by different firms for unit output and to switchover to more cost effective feed stocks. The scheme provided incentives to firms to accomplish the transitions as soon as they can by a concession scheme administered group wise and by a pre-announced schedule of concession reduction. The concessions were so designed that any firm that makes the changes in time remains viable and a firm that does it sooner gets additional profit.

At the end of the transitions, no concessions will be necessary for gas-based plants. All other plants using any other feedstock will be entitled to a feedstock differential corresponding to feed stock cost difference between gas based and an LNG based plant.

The outlay of subsidy to industry for urea production would reduce from more than Rs.9000 crores to Rs.1000 crores. The cost of subsidized coupons to 105 million farmers would be around Rs.2000 crores.

The Commission also recommended that if a state government imposes any additional

burden, by way of excessive levies on the inputs or on finished fertilizers manufactured/ sold in the State then these costs should be passed on to the farmers in that State.

In sum, it should be noted that the suggested scheme to take the fertilizer industry to a liberalized competitive set up: Retains self sufficiency, Preserves viability of existing units, Protects small farmers, Reduces subsidy outlay and is implementable.

Electricity Reforms: Agricultural Prices and Pilferage:

This was written in later 1999. The T&D (transmission and distribution) losses have plagued India's electricity sector for long. This was a suggestion to deal with the problem.

I argued that unless the State Electricity Boards (SEBs) become financially viable other reforms would not be effective. Without financial viability private power would not come. The scope for raising tariff for the industrial consumers to cross subsidize farmers is limited. If the prices are raised too much, industry would put up captive plants and SEBs would be even worse off. We see this today. We have 100000 MW of installed capacity with utilities and 25000 MW of captive power with consumers. Agricultural power tariff is not increased because of the political clout of the farm lobby. I had suggested a way to co-opt farmers to agree to pay higher price in return for a better quality supply i.e. uninterrupted power at a stable voltage.

Raising Agricultural Tariff:

Raising agricultural tariff will go a long way towards making SEBs financially viable. However, at a recent seminar at Harvard University, Mr. Baijal, then Special Secretary in Ministry of Power, argued that agricultural pricing is not an important issue and that T&D losses are the main problem to deal. I argue here that while T&D losses are underestimated and agricultural consumption is overestimated, raising agricultural tariff is still most critical as it provides a cover for pilferage, and of course, we should deal with T & D losses as well.

In 1997-98 the total power sold to agriculture as per Planning Commission document was 88.78 billion kilo Watt hours (kWh) which was 30 percent of total units sold. The estimated subsidy on it was around Rs.10000 crores. This is an overestimate as agricultural

power consumption is not measured but only estimated. This provides much scope for stealing power and ascribing it to agriculture. There is no doubt that a lot of this happens.

We can also get some idea of how much agricultural power is actually consumed by looking at the implied consumption per electrified pump set. By the end of March 1998, there were 11.85 million electrified pump sets. The average capacity of a set is around 3.5 kilo Watt (kW). This implies a consumption of about 7500 kWh per pump set or 2150 kWh per kW. This means that a pump set is operated about 25% of the time in a year. This is surely an over estimate. This is now well established after many state electricity regulatory commissions got agricultural consumptions estimated better, the T&D losses have gone up by more than 10 percentage points in many states.

Electricity is provided to agricultural users at highly subsidized rates. The agricultural lobby was unable to extract this subsidy since, initially electricity demand by agriculture was a small part of the total demand. It was 3.9% in 1950-51, 6% in 1960-66 and now exceeds 30%. The burden of subsidy until the mid-1970s was relatively small and spread out over a large number of other users who did not oppose it. The farm lobby had no difficulty getting electricity (and other agricultural inputs) at concessional rates. Perhaps there was also some social justification for such a subsidy as it accelerated diffusion of new technology.

Over the years, the situation has changed and new political pressures are developing for reforms. The burden of cross-subsidy is biting other users who are beginning to resist. At the same time, these subsidies have so crippled SEBs that their ability to meet demand is severely limited. Even farmers feel the loss due to an unreliable and frequently interrupted power supply.

The farmers themselves would be better off if they were to pay higher price and get an assured supply of power. They would be therefore, willing to pay higher price if only they are convinced that this will result in better quality of power. At present, they don't trust that it would happen. There is, thus, a chicken or egg problem. Power supply quality cannot be improved without raising power prices for farmers and farmers won't pay more unless power quality is improved. How to get around this chicken or egg problem?

This can be done by linking power tariff to the actual quality of power supplied. They pay the higher price only if they get good quality power supply, otherwise, they pay what they pay now. Thus, for example, suppose in a state the farmers today pay 50 paise per unit and the

supply is so bad that they get power only at night for eight hours. We tell the farmers that they will have to pay Rs2.00 per unit but only if the power is supplied at the right voltage and with a given confidence level say for example, 99.5 percent of the time. If the supply is not of this quality, they pay only 50 paise.

This can be implemented by installing it meter at the substation level, which will record round the dock the power supplied and the voltage at which it is supplied. The meter can be under the joint control of the state electricity board (SEB) and the farmers' cooperative and should be tamper proof. Thus, the quality of power supplied can be indisputably established.

A meter that traces a graph round the dock will be difficult to falsify. Even then to guard against collusion between SEE meter readers and farmers we can employ a cellular phone transmitter that sends the reading every few minutes to the central computer. Such a transmitter can be put in a sealed steel box if need be. The cell phone network is today widespread and the technology is readily available and inexpensive.

This can be introduced taluka by taluka. The electricity boards will get money only if they improve the supply. They would also have to be responsible. The small amount of resources needed to improve the supply in a taluka and initiate the process may be provided to SEBs.

The farmers should be willing to accept this. If a farmer were to get power on demand instead of only eight hours a day, he can run his pump round the clock and either irrigate more land or sell surplus water to his neighbour. In either case, he will make much more money than he would pay for the power even at Rs.2.00 per unit. Farmers who buy water from their neighbour today pay RS.800 to Rs.1200 per hectare.

Reducing T & D Losses:

Our SEBs have unusually large T&D losses. Some even call it theft and dacoity losses. The average losses for 1997-98 were 21.8% of the total availability. For Delhi, it was highest at 43%. Orissa followed with 39%. Delhi having very little agricultural load had less opportunity to hide these losses as consumption by agriculture. If we assume that greed and stealing are perhaps at their maximum in Delhi, then we could take the Karnataka estimate of 30% as a likely

rough estimate of T & D losses in the country. Agricultural consumption may thus be overestimated by one third. Even then reforming agricultural power tariffs will collect some Rs.7000 crores a year for SEBs and is a very critical aspect of power sector reforms. Nonetheless, it does focus attention on T & D losses as the other most important aspect of power sector ill health.

T & D losses in a developed country would be around 8 to 10%. Some losses are unavoidable and T&D losses should be somewhat higher in India. It is true that when electricity is transmitted over a line some energy is lost in overcoming the resistance of the wire. Some loss also occurs in the transformers, which step up and step down the voltage. The quality of maintenance of the lines and equipment also affect the losses. Also in India where the consumers are spread out over large areas and they consume small amounts of electricity, the distribution losses are bound to be higher. Delhi, however, does not have this excuse. Consumers are not spread out. Delhi's T&D losses should be comparable to industrialized countries. Even accounting for thinly distributed consumer load, our T&D losses are very high. It is quite likely that some 15 percent of the available power in India is pilfered.

The economic value of this pilferage, at the average cost of generation of about RS.2.0 per kWh, is around Rs.9000 crores per year. Why do we permit such blatant theft? The SEBs and the Central Electricity Authority have not emphasized this aspect so far. What can be done about it?

In a sense the T & D losses should be much easier to reduce than reforming agricultural tariff. A far smaller number of people have vested interest in it. Agricultural tariff would affect some 12 million owners of pump sets. SEBs employ only about 0.94 million people. And of course not all of them are corrupt. To this we have to add those who benefit from this free power. They may be many but they have no moral right to it and cannot come out to defend it. The losers are all the other consumers, the whole country and in the long run even those who pilfer power. The technical solution is simple. Install temper proof meters at all nodes and substations of the network. This will provide detailed information on where power is flowing. This can be done on real time and in a computerized way such that cell phones will feed the data in the central computer every hour. With the computerized billing system we could analyze past data on paid consumption on each line. The flow can be monitored to see if it matches the paid

demand on each line. Mismatches can be easily detected and raids mounted to catch the culprits red handed. All we need to do is to catch a few of them and mete out exemplary punishment. Others will fall in line. All of us will benefit and even tariff can be reduced so that we will get cheaper electricity.

What if the SEB staff does not cooperate? What if they destroy the meter? It should be possible to lock the meters and assign responsibility clearly to specific staff members. Access can be restricted to limited and specific persons. It should be possible to enforce the scheme. All we need is to appreciate the dimension of the loss, the stakes involved and an informed public that appreciates what the government is doing. People will support strong action.

Gas from IRAN: Securing a Common Pipeline through Pakistan : A 'MAD' Proposal

This was written in late 200l.

The third oil shock has raised deep consensus about our energy supply. We were lulled into complacency due to low oil prices. From 1995 to 1997, crude oil price in international markets hovered around US$16 to $18 for most of the time, excepting for five months when it remained between $20 to $22 per barrel. 7.3 barrels of crude oil make one tonne. Since 1998, till the increases in late 2001, the price had ranged between from $10 to $13.5 per barrel. With such cheap oil, India's oil consumption had grown rapidly. It grew at 6 percent per year and in 2000-01, it was nearly 100 million tonnes.

Unfortunately, our domestic production of crude oil has stagnated at around 33 to 35 million tonnes. Thus, we import some 65 million tonnes of crude oil and petroleum products every year.

An increase of US$10 per barrel means that India will have to pay 10 x 7.3 x 65 = US$4745 million more i.e., some Rs.22000 crores more. The world market price in recent weeks has shot up to $35 per barrel. One hopes that it will come down to around $25 a barrel in coming months. Whatever level the price stabilizes, it is nearly certain that in the coming year, we will have to spend $6 to 8 billion more for imports of oil.

This poses a serious challenge to the government's fiscal policy. If the price increases are not passed on to the consumers, the oil pool deficit will rise. Lowering customs duty and excise rates on oil imports without increasing consumer prices is no solution. It merely reduces oil pool deficit by increasing centre and state governments' deficits.

Thus, either the government raises consumer prices or raises fiscal deficit. Of course, the fiscal deficit can be financed in alternate ways. If it were financed by a bond, then its inflationary impact would be smaller than if it is financed by printing money. On the other hand, raising consumer prices for oil products also pushes up prices. Thus, some added inflation is inevitable. Some oil product prices have to be raised now or later because they are below import parity prices and involve subsidies. So, this may be a good opportunity for the government to gather courage and reform oil prices.

What are the options? The main subsidies are on diesel, kerosene and LPG. These three also account for 60 percent of oil consumption. Diesel consumption constitutes 42 percent, LPG 6 percent and kerosene 12 percent of total consumption. Thus, for raising revenue, it is inevitable to raise their prices.

Increases of Rs.3 per litre of diesel and kerosene and Rs.50 per cylinder of 14.5.kg, will result in some Rs.15,000 crores of additional revenue in a full year. For the remaining financial year, this could bring in Rs.7000 crores. The immediate issues are somewhat straightforward. There is not much of a choice. The long term issues however, should make us think. How we to meet our oil are needs in future at reasonable cost and without being vulnerable to shocks?

Our response has to be three fold: Reduce oil consumption through conservation, increase exploration efforts domestically or in other countries to increase supply, and find alternative fuels that can replace oil.

I deal with one of the third type of options now. A gas pipeline from Iran, Oman, Qatar or Turkmenistan can supply us natural gas in good quantity and at a good price. The only catch is that the pipeline has to pass through Pakistan and that raises all manner of doubts about security of supply.

A deep sea pipeline from Oman to India was examined sometime back. Though not impossible, it posed enormous engineering challenges and the uncertainty of costs involved

seems to have shelved the project, at least for the time being.

A land based line through Pakistan would be easy to construct and would not be expensive. The question is how do we cooperate with Pakistan? Would it be willing to do so? What is in it for Pakistan?

The first thing to note is that both India and Pakistan can use more natural gas. Also there are significant economies of scale in construction of gas pipelines, so that both Pakistan and India would save a lot if a larger pipeline is built and costs shared.

Tongia and Arunachalam (Economic and Political Weekly, May 1-7, 1999) have explored these costs. They show that transmission costs per unit of gas, with a pipeline carrying 20 billion cubic metres (BCM)/year of gas will cost only a bit more than half as much as a pipeline carrying 10 BCM/year. Thus, a separate pipeline carrying 10 BCM/year of gas would deliver gas to Pakistan at U5S2.35 per million Btu whereas a pipeline of 20 BCM will deliver gas at US$1.9 per million Btu. The total savings would be more than $200 million a year.

Gen. Musharraf has talked about such a pipeline and India should pursue this. Can we ensure security of supply through Pakistan? What if Pakistan turns off the gas? Wouldn't a terrorist group disrupt the supply? These are genuine concerns but one can find solutions to these. We need to create vested interests or stakes in the functioning of the pipeline in both India and Pakistan.

Suppose Pakistan is obliged to pay Iran for all the gas that the pipeline could carry less what leaves Pakistan. If Pakistan stops supply to India, it will have to pay for all the gas. That would be a huge economic burden on Pakistan. However, in a situation of war, Pakistan may be willing to pay that price. Such disruption or an attack by a terrorist group would lead to only short term disruptions of supply. To guard against them, we will have to build dual fuel power plants or fertilizer plants that can use either gas, fuel oil or naphtha. We can also have a national gas grid where this gas feeds in along with domestic supply. We can build a reserve of LNG and so on. We can tide over short term disturbances.

I suggest a way by which any disruption of supply to India also results in disruption of supply to Pakistan. A mutual assured disruption (MAD) would compel both the countries to honour the treaty. This is similar to our water treaties where each of us can disrupt other's

supply. This has worked for 25 years and so can a similar gas treaty.

How de we accomplish this? I suggest that the pipeline first crosses Pakistan and Pakistan supplies Lahore and Islamabad from a point which is on this side of the border, or Indian territory. Then, if gas supply is disrupted in Pakistan, then Lahore and Islamabad would also suffer. If India disrupts supply to these cities, Pakistan can stop supply altogether. We can even agree to let an Iranian or Omani firm manage this dispatch station on Indian territory. I think this is workable and mutually beneficial. It will also reduce our dependence on oil.

Effective Affirmative Action without Reservation:

The introduction of reservations for economically backward persons in Rajasthan by Chief Minister Gehlot last year once again raised the issue of fairness and reservation. This is an attempt to please the upper caste Hindus who feel reservations for persons from Scheduled Castes (SCs), Scheduled Tribes (STs) and other backward castes (OBCs) are unfair to them. A similar feeling of reverse discrimination is also felt in the U.S. by the white majority about affirmative action that gives preference to blacks. However, the U.S. Supreme Court has ruled last month that affirmative action by University of Michigan where race is used as a criterion is not unconstitutional.

By and large at the time of independence, we had a consensus in the country that we need to take special measures to help persons from SCs and STs overcome the disadvantages arising from centuries of discrimination they had faced. The reservation for jobs and admissions were provided in the constitution for a limited period of is years. Not only have the reservations continued till today, reservations have been expanded to include OBCs and now to poor caste Hindus.

Admissions and job reservation for scheduled castes and scheduled tribes have benefited the SCs and 5Ts. However, there is a feeling that the benefits have been mainly cornered by the so-called creamy layer of people who have already benefited from reservations in the past and whose children cannot be considered as deprived. As the proportion of reserved seats and jobs has expanded, much resentment against reservation has built up. This is aggravated by the creamy layer syndrome. When you lose a medical seat to someone from SC with barely

qualifying marks whose parents are IAS officers and who has had a privileged upbringing, a deep sense of injustice is created. On the other hand as Babu]agjivan Ram who belonged to a SC and who was a Minister in the Central Government for nearly 30 years observed, even creamy layer suffers discrimination. No matter that his son is a Minister's son, he still suffers from discrimination. He would not be invited to upper caste homes for dinner nor would an upper caste girl marry him.

Reservation also has a slightly unpleasant taste. It does not treat all Indians equally as the constitution guarantees. Also those who benefit from it carry a stigma. A person who has been admitted or promoted because of reservation would be looked down upon by fellow students or colleagues as some one not up to the mark. Even when they don't express it, the person himself might sense this feeling and might even share it. His own sense of self-worth may get lowered. Reservation also reduces the motivation to do ones best in an examination of a person from SC, ST or OBC.

How can we design a system that benefits the truly disadvantaged, does not destroy individual incentive to do one's best, is constitutionally fair, is acceptable to all and is self liquidating? Here is a proposal:

We can safely assume that all Indians have the same genetic back ground and have the same potential, apart from the statistical variation one would find in any group. One's performance in an examination is a function of what one has achieved. Achievement depends on potential and on nurture. A person from a backward caste, with illiterate parents, who has grown up in a small village and is poor would not perform as well in an examination or a test as another who is from an upper caste, has professional parents, is rich and has gone to a good quality urban school, even when both of them have the same potential. That is why many countries try to base their admissions on some kind of an IQ test. IQ tests try to measure potential or innate intelligence. Such tests are however not completely free of nurture or background bias. Through practice and preparation one can improve one's performance up tea certain level in such tests.

If we can make admission based on a merit list adjusted in a transparent manner for differences in nurture to reflect true potential it would be seem to me a fair and just system. The question is how to measure potential in a way that accounts for differences in background and

nurture? The potential can be measured as follows. We take the Secondary School Leaving Certificate Examination given by the state as the starting point. These examinations are now taken by lakhs of students. We will then take the average of each subgroup of students. The subgroups may be 1) backward caste, with illiterate parents, coming from a small village and poor, 2) upper caste, has professional parents, is rich and from private urban school, and so on. We can differentiate many such groups. Then we take the difference between the highest average scoring subgroup and the average of a particular subgroup and then add that difference as a nurture handicap to the marks of all those who belong to that particular subgroup. After this the admission is strictly on merit. Of course the handicaps will be updated every three years.

Such a system has many advantages. It will not destroy the incentive to work hard of people from disadvantaged groups. A bright student will increase her chance of getting admitted the more marks she gets. At presents all she has to do is to get minimum qualifying marks. The creamy layer will automatically move out to another group with a lower handicap value and eventually over time the handicaps will disappear. This will be consistent with the constitution and fair as all are treated equally. It should be generally acceptable as most Indians are not against such affirmative action but are disturbed by the unfairness when the benefits are cornered by the creamy layer.

Note that the proposed system would take care of economic backwardness also. It will thus obviate the need for the kind of measures the Rajasthan Government has taken. In fact, in this system there is no need to allocate reservation quota. Any group that feels it is disadvantaged can be considered as a separate group. Of course, one would not want a group to be so small that there is not enough number of students of that group appearing for the school leaving certificate examination. One might have to impose restriction that a separate category requires at least a certain number of students, say one thousand.

The system can be used for all admissions, or even entry-level jobs, which are based on common admission tests such as banking service, etc. If the basic premise of the system were correct, that people selected are the ones with best potential for achievement, there would not be any need to have reservations in promotions.

It is worth emphasizing that the system is self-liquidating. Once we have provided equal opportunities to all groups and as backward groups make progress, the differences in the average

marks obtained will decrease and eventually disappear.

This to me is a very attractive feature of this scheme.

Alternatives to Women's Reservation:

We have had women Chief Ministers in seven states, Tamil Nadu, Bihar, Punjab, U.P., Delhi, M.P. and Rajasthan. It is amazing that in all the states of the Hindi heartland barring Haryana, we now have had a woman Chief Minister. Chaudhury Charan Singh's soul must be wondering what is happening in his homeland where women were supposed to be in the kitchen. It is remarkable that at least some women are being treated as equal or more than equal. Does this imply a sociological revolution? Unfortunately, I don't think so. We are used to worshipping Goddesses and fearing them too. That has never meant that we treat women generally as equal.

With five women Chief Ministers and the sixth one, Mayawati, who can come back any time, do we need women's reservation? These six but one has been elected on their own strength without the benefit of reservation. Yet I think reservation is needed. A true indicator is not how many women Chief Ministers we have but how many women MLAs we have. The Election Commission's website provides data on how many women candidates were there. In the five state elections held recently women candidates constituted less than 10 percent of the candidates. Thus in Chhattisgarh there were 62 women candidates out of 819, in M.P. 199 out of 2171, in Mizoram 7 out of 192, in Delhi 78 out of 117 and in Rajasthan 118 out of 1541. The numbers of women elected were 5 in Chhattisgarh, 19 in M.P., 6 in Delhi and 12in Rajasthan. Their success rate was more or less similar to that of men. Yet women have a long way to go. We need greater representation of women because women are mistreated in the country. There are issues that concern women that don't get adequate attention. For example we don't have any problem importing petroleum products for automobiles but cannot provide adequate clean fuels to women in rural areas, for want of which they suffer enormously. Also had women greater representation, the problem of drinking water would have gotten a much higher priority. Men, no matter how empathetic cannot fully appreciate women's problems. For a balanced society that is gender just, we need balanced legislatures. We need more MLAs and MPs who

would voice women's concerns and guard their interests.

The reservation proposals made to provide 30 percent seats to women, however, have problems and are not getting through the parliament. The practical difficulties of reserving 30 percent of seats are considerable. Which seats should be reserved for women? One way would be to randomly select 30 percent of the constituencies and keep them for women forever. Then, the women in the other 70 percent of the constituencies would not be represented. This would be a discrimination that would not be acceptable to the women of these left out constituencies. At the same time, men in these reserved constituencies would be forever denied a chance to represent their constituency in the parliament. Another option is to randomly select at every election 30 percent of the constituencies and reserve them for women. This poses its own problem. MPs who perform well and nurture their constituencies may suddenly find themselves deprived of even a possibility of re-election. This will take away all incentives from MPs to nurture their constituencies. The uncertainty created, is not likely to be acceptable to most politicians. What is more, it is not in the interest of the people as well. Is there a way we can make reservation work?

I repeat a suggestion that I had made some time ago. Instead of 30 percent let us have 50 percent reservation. That makes sense as women constitute 50 percent of the society. Then we can have one woman and one man represent each constituency. Thus, 50 percent of MPs would be men and 50 percent women. This does not have the problems of no reward for constituency nurturing and uncertainty introduced by randomness. To avoid doubling the size of state legislatures and the parliament and building a new parliament house and legislature assembly buildings, we can merge two neighbouring constituencies into one, and let it be represented by a man and a woman. Each voter casts two votes one for a man and another for a woman candidate. The number of MLAs and MPs would remain more or less constant. In fact, it may increase by one as the number must be an even number. Of course, this will give women more than 30 percent of the seats, which is now suggested. That should only be welcome by women. But many more men would have to make space for women. This they would not like to do.

In any case, I feel reservations are not the best way to deal with the problem of inadequate representation of women. Reservations involve a stigma. A women elected on a

reserved seat may not have the same self-assurance as a woman elected on a non- reserved seat. Also reservations create a vested interest.

One would like to find a way that over time liquidates itself. This should be built into the system so that reservations or affirmative actions do not perpetuate themselves. I repeat another and my preferred proposal. Provide a special advantage to women, which over time, liquidates it self. Suppose, we begin by saying that to the votes polled by every woman, 10 percent of the total votes polled in that constituency would be added. This will give a tremendous incentive to parties to field women candidates. A male candidate can defeat a female opponent but he would have to have a margin of more than 10 percent. So men are not completely ruled out.

One may question why 10 percent? I have no real argument for it. It is just a number picked from air. It could be any number. It should be based on the analysis of election results. For example in Rajasthan with a handicap of 5 percent of polled votes, 11 more women candidates would have won and with a 10 percent 17 more women would have been elected. We could say the special advantage will be determined after all the seats in a state are counted and then as much advantage as needed would be provided to ensure that 30 percent of the MLAs are women. This is an Ideal solution. But it creates a practical difficulty. Suppose election results cannot be declared till counting is completed in all the constituencies of the state. It can even happen that election in one constituency is declared null and void, in which event; all the results may have to wait till re-election is completed. This is obviously unsatisfactory. So what we should do is to announce a special advantage based on previous election and accept whatever number of women candidates gets elected. If more than 30 percent women MLAs are elected, then in the next election, the special advantage will be reduced.

The attraction of such a system is that over time, the special advantage disappears to zero and the whole system becomes redundant. This will happen when women as a class have made progress and have become truly equal not in their potential (which they already are) but in the realization of their potential. In Scandinavian countries, without any reservations, around half the MPs are women. We could and should attain such a state. Then, the stigma of reservation would disappear. Without any special advantage and as a matter of course, women

MLAs and MPs would constitute at least 40 percent of our Parliament and may be half of it.

This should be the objective of reservation policy: to give incentive to parties to put up many more women candidates. The system I have suggested does that and what is more, it does not get entrenched but liquidates itself.

Using Markets for Sustainable Forestry:

An example where financial markets can play a locative role is in sustainable exploitation of forests. Today, a forest contractor has no incentives to nurture the forests assigned to him. He would like to fell it. The forest department is forced to micro-manage his actions, but the forest department officials are only human. Over the last 50 years, the area under the forest department has risen, but the area under forests has gone down.

The problem arises from the fact that ownership of the forest is not with the contractor. If forests were privatized, however, there is no guarantee that they would be maintained as forests. Even if the land contained trees, the private owner may prefer a commercial plantation with inferior bio-diversity.

We need to constrain the private operator's behaviour to ensure sustainability. One can think of giving out forests on long-lease to private firms with a stipulation that a forest of the same quality (as defined by some objective metrics about a bio-mass, bio-diversity, etc.) will be returned in 15 years. The failure to do so would evoke substantial penalties. However, how would we ensure that the terminal conditions generate altered behaviour today? One way is to require that these leases are only given to joint-stock companies with shares which are meaningfully traded on the stock market.

The stock market would know that a large penalty awaits the company if the forest is not maintained in adherence of certain minimal standards. Security analysts today visit the plants of companies that they cover; it is not unreasonable to think that they would visit the forests which are comparable productive assets. The stock market would do this monitoring in a more efficient and corruption-free fashion as compared with any bureaucratic organization.

Similarly, it is feasible for voluntary environmental groups to visit a given forest once in 15 years and verify the correct calculation of penalties. In contrast, it is infeasible for them to

ensure the honest day-to-day micro-management by the forest department which is required to produce good behaviour on the part of forest contractors. Of course, markets are not a perfect and infallible monitoring instrument. Yet, they offer a much better chance of success than our current system of control by fallible human bureaucrats. The penalty must be credible and enforceable. One can think of many ways of doing this For example, requiring a bank guarantee or insurance.

Conclusion:

These varied examples have one thing in common. Each of it looks at the incentives of stakeholders and then works out solution that respects their incentives.

The perspective is that of descriptive general equilibrium. With little bit of a solution seeking attitude and the approach of an engineer thrown in, one can design policies that I believe have better chance of acceptance and success.

References:

- Eckaus,RS., and Parikh, K.S. (1968), Planning for Growth – Multi-sectoral Intertemporal Planning Models Applied to India, MIT Press, Cambridge.

- Kelegama, Saman and Parikh, Kirit (2003), "Political Economy of Growth and Reforms in South Asia" in Ahluwalia, I.J. and Williamson, John (eds.), The South Asian Experience with Growth, Oxford University Press, New Delhi.

- Narayana, N.S.S., Parikh, K.S. and Srinivasan, T.N. (1991), Agriculture, Growth and Redistribution of Income: Policy Analysis with a General Equilibrium Model of India, in North Holland's Contributions to Economic Analysis series with an Indian edition by Allied Publishers, New Delhi, 1991.

- Expenditure Reforms Commission (2000), Rationalizing Fertilizer Subsidy, Coauthored with Geetha Krishnan et.al. 2nd Report Submitted to Ministry of Finance.

- Planning Commission (1964), Notes all Perspectives of Development, India: 1960-61 to 1975-76, Perspective Planning Division, Planning Commission, Government of India.

- Rudra, Ashok (1976), The Indian Plan Model, Allied Publishers, Bombay.

- Rao, Manohar (1987), Filtering and Control of Macro-economic Models, North Holland.