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Keeping the Nuclear Option Open What It Really Means

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ON November 4, immediately upon recent reports of Pakistan having tested a nuclear device, Raja Ramanna, chairman of the Atomic Energy Commission (AEC), called a press conference. India, Ramanna announced, had developed the capability to enrich uranium upto any level—including that required for a nuclear weapon. In fact, he said, an experimental facility had been in operation for some time at the Bhabha Atomic Research Centre (BARC) in Bombay.

While Pakistan had set up a full scale manufacturing facility at Kahuta, the impression created at the conference was that India had set up only a laboratory experiment, a pilot plant. The modest scale seemed to be in keeping with India's policy of having no intention of making a bomb, and of "keeping all options open".

In fact even before the pilot plant at the BARC produced any significant results, the AEC seems to have decided to set up a full-fledged plant to enrich uranium on an industrial scale. India's industrial enrichment facility, called the Rare Materials Plant (RMP), is reportedly located at Ratanhalli, 20 kms off Mysore in Karnataka.

The basic requirement for a nuclear weapons programme is the ability to produce enough bomb grade fissile material. There are two routes to a weapon, uranium and plutonium—and India has opted for both.

The 40 MW Cirus reactor and the 100 MW Dhruva operate so that they yield enough weapons grade plutonium. And the RMP at Ratanhalli is designed to produce supplies of enriched uranium. Such full scale manufacturing facilities, far beyond pilot experiments, are a part of "keeping options open". Indeed, in the years since the Pokhran blast of 1974 India has very significantly developed the infrastructure for a weapons programme.

AT GREAT SPEED

The programme has moved with great speed under a political imperative. Expenditure of over Rs 200 crore has been already sanctioned for the Ratanhalli complex. The civil construction is almost complete. At any large enrichment facility, uninterrupted high frequency power is a prerequisite. This is guaranteed at the Ratanhalli complex.

The initial experimental facility, a small pilot plant, was first set up in early 1984 at the BARC complex in Trombay. Work on the sophisticated engineering techniques involved had been going on for ten years before that. About a hundred centrifuges are believed to have been installed in the pilot plant. The enrichment required for a nuclear weapon is about 90 per cent. The pilot plant achieved enrichment of less than 2 per cent.

Each batch of centrifuges is called a stage, and the complete set a cascade. The size of

the stages varies greatly. Those feeding the natural uranium into the cascade are the largest, and the final product stages are the smallest. In each stage, there is a concentration factor of 1.005. So in order to concentrate a substantial quantity of the fissile isotope uranium-235, several thousand centrifuges are required in an enrichment facility.

The centrifuge motor must rotate at great speed—about 80,000 revolutions per minute. As a result the stability of the material of construction is put to great test. Apparently, Indian scientists have succeeded in producing both high speed motors and an alloy which can withstand such great stress. A special purchase cell has been set up to import a range of components. These include electronic and mechanical devices for controlling motor speeds.

At any given time, with centrifuges of a reasonable separative capacity, it is possible to produce either a large amount of uranium with low enrichment; or given enough time, a small amount of highly enriched uranium. In order to do both, to produce a large amount of highly enriched uranium, requires a large number of very powerful centrifuges. However, as Atomic Energy Commission chairman Ramanna said, "It is only a matter of adding more units" to achieve a higher level of concentration of fissile material.

Because of the great urgency attached to the programme, AEC scientists skipped the stage of scaling up the pilot plant by 15 times. Indeed, this decision was taken even before the first pilot plant achieved any significant production of enriched uranium. They are now scaling up the pilot plant directly on site at Ratanhalli—fifty times.

PLUTONIUM ROUTE

The second route to the bomb is plutonium. The Dhruva reactor at BARC, Trombay, begun in October 1975, is designed to produce weapons grade plutonium. It takes 6.5 kgs of plutonium for a bomb. Dhruva when fully operational will produce 25 kgs a year.

Dhruva's fuel cycle is chosen for a single purpose. For instance, compared to Tarapur, where fuel rods are inserted for 15,000 megawatt days a tonne—which is optimum for power—Dhruva has a fuel cycle of only 1,000 MW days. This is ideal for the highest concentration possible of the bomb-making isotope of plutonium, plutonium 239. Beyond that point, other isotopes of plutonium build up and make it unusable for a weapon. It is estimated that 60 to 150 kgs of plutonium has been stockpiled at BARC from the 40 MW Cirus reactor (which falls under no international safeguards). This reactor became critical in 1960.

India has always described the develop-

ment of such manufacturing capabilities as "keeping the option open". In fact, keeping the option open is to stop just short of the final step of assembling the weapon itself. In nuclear terms, no real neutrality is possible. Keeping the option open is not half-way between 'yes' and 'no'. Keeping the option open entails setting up a plutonium re-processing plant and a uranium enrichment facility as well. In other words, developing the capability to produce not one, but two kinds of nuclear weapons.

CHANGING OFFICIAL ATTITUDE

Over the years, the attitudes of successive Indian prime ministers on the question of whether India should make a bomb have altered radically:

Prime Minister	Date of Office	Attitude to a Nuclear Bomb
Jawaharlal Nehru	1947-64	Never
Lal Bahadur Shastri	1964-66	Not at present
Indira Gandhi	1966-77	Let's keep the option open
Morarji Desai	1977-79	Against a nuclear explosion
Indira Gandhi	1980-84	Open option
Rajiv Gandhi	1984-	Open option

Rajiv Gandhi's position, like Indira Gandhi's, is almost diametrically opposed to that of Jawaharlal Nehru. As he put it in an interview to *Le Monde* last year: "If we should take the decision to become a nuclear power, it would be a matter of a few weeks, or a few months."

The development of this particular capability has been a matter of policy for some years. That India had set up plants not only to reprocess plutonium but to enrich uranium as well, was acknowledged long ago. Contrary to the prevailing impression, Raja Ramanna's statement on November 4 this year was not the first official acknowledgement of the fact that India had an enrichment facility. The first official disclosure in fact seemed to have been made by Indira Gandhi herself in March 1984. "The government", she said, "is aware of Pakistan's efforts to acquire uranium enrichment capability to assemble a nuclear weapon. This, however, does not mean that Pakistan is ahead of India in atomic energy development." In fact, she added, "Indian scientists are keeping abreast of all aspects of research and development connected with enrichment technology."

The press conference called on November 4 is the first time in two years that the authorities have specifically referred to India's enrichment capabilities. Since Indira Gandhi's statement in 1984 this is the first reference to a specific technology. Raja Ramanna's press conference has in fact come at the peak of a subtly orchestrated campaign

by the government to prepare public opinion in the country for some imminent and crucial resolution. Particularly around May last year, official pronouncements on the issue came thick and fast. On May 4, the AICC, in passing its international and political resolutions, took a pledge "to fight divisive forces, and to meet the security threat posed by Pakistan". The pledge followed a widely quoted assurance by the prime minister of the government's readiness to take all measures to meet the threat, in the face of Pakistan's efforts to acquire a nuclear capability. To political commentators in the country, the meaning of his assurance was clear—if Pakistan made a bomb, we would too.

Earlier that week, Narasimha Rao went out of his way, in the course of a Lok Sabha debate, to solicit MPs' views on what the government should do if Pakistan were to acquire a bomb. As G K Reddy observed in *The Hindu*: "This was the first time that the government had encouraged them [the MPs] to voice their feelings on the question without inhibition, knowing full well that the majority of them would want India to make the bomb." The campaign produced the desired result. Barring the CPI, the entire op-

position has voiced itself strongly in support of exercising the nuclear option. This is a stand adopted by most national newspapers as well.

In the months that followed, official statements showed a new edge. On August 8, for instance, Khursheed Alam Khan, minister of state for external affairs, said that "we would answer stones with stones", in other words, as the press reported it, the policy was a bomb for a bomb. "India", Khan said, "had demonstrated its capability in 1974", referring to the Pokhran blast.

Yet at the height of such an organised campaign it was still possible for Rajiv Gandhi to say on NBC's 'Meet the Press' show, during his visit to the United States, that if Pakistan were to go nuclear, "the counter to that need not be nuclear. That would be the last choice, really. We do not want to waste money on making a bomb"

Commenting on Pakistan's uranium enrichment plant, Rajiv Gandhi recently argued, quite correctly, that it could only be used to make raw materials for weapons, since none of its reactors used enriched uranium. With the setting up of the RMP, the same can be said of India.

outputs, and taxes on agricultural exports) are criticised.

I

Self-Sufficiency in Food

The policy goal which has perhaps come under most severe attack is that of achieving self-sufficiency in food. "... there is little reason for wasting resources to pursue self-sufficiency in food" (p 79). Government interventions in marketing, consumer subsidies and producer support programmes receive censure, as the WDR argues for increasing the role of market forces, and the use of international trade to achieve efficiency and to cope with food surpluses or deficits. The costs of self-sufficiency are said to be enormous. While acknowledging the successes in food production in some countries "reflecting the efficient adoption of new crop varieties and techniques by Asian farmers and improved policies for agriculture" (Box 4.7, p 78), the report maintains that "such successes do not necessarily mean that self-sufficiency is a desirable policy. Substantial gains from trade can be foregone in its pursuit" (loc cit).

Whatever the merit of the short-run economic argument (which itself is questionable) abandoning self-sufficiency in food as a national objective has important political implications. It is a policy fraught with long-term dangers. Food security therefore is undeniably a political question, and no economic argument can be a substitute for political realities. As Lester Brown of the World Watch Institute has argued in his paper "Politics and Responsibility—the North American Basket", food is a potent political weapon. We in India need hardly be reminded of our own bitter experience with PL 480 in the mid-1960s. There are also several recent examples of food embargo against countries following political lines unacceptable to some major powers.

There are also strong economic reasons in favour of food self-sufficiency. It is well known that the major barriers to international trade originate from the industrial countries. As pointed out in (p 123 of) the WDR, the agricultural policies of the industrialised countries are aimed at solving their domestic economic difficulties, and therefore it is difficult to assume that they will modify their policies to suit the requirements of developing countries. It is evident from the report that the trade barriers of the industrialised countries have become more restrictive over the years. Therefore, to expect these countries to liberalise these policies may be unrealistic. On the other hand in the longer term, the more likely outcome of these policy prescriptions, if they are followed by the LDCs, will be a decline in LDC food output with a consequent increase in world prices. Farmers in the developed countries would then no longer require subsidies and the dependence of LDCs for food imports will rise. The consequences pointed out in the Lester Brown paper may well turn out to be real. Even if one succeeds in developing international safeguards against the use of food export as a political weapon, a number of studies indicate that normal trade movements have failed to reduce international or even national differences between regions, in the

Trade and Pricing Policies in Agriculture

Report of a Seminar

THIS year's World Development Report (WDR) marks the 9th such report published by the World Bank. In view of the Bank's position as an important, influential and financially powerful international institution all WDRs acquire a special significance. In recent years the bank has sought to get its message across in India through seminars by WB staff on the WDR at different locations within the country. One such seminar was held at the Centre for Development Studies on August 25. This critique is based upon the discussion at this seminar.¹

The WDR 1986 focuses on two themes—(1) the hesitant recovery since 1980 and prospects for sustained growth in the world economy over the next 10 years, and (2) trade and pricing policies in world agriculture. The second is the more important part of the document. The central message is that the present policy package in agriculture with respect to trade and pricing is globally non-optimal. It discriminates against agriculture in LDCs where there are shortfalls, while subsidising agriculture in the developed countries where there are gluts. The report calls for trade liberalisation of agricultural products, and the adoption of free market, comparative advantage-oriented policies to stimulate growth. Indeed, there is a remarkable family resemblance between the policies advocated by the WDR, and those associated with the Reagan Administration.

The report comes at a time when the pick-up in growth from the world recession of 1980-82 is not as marked as the expansionary phases of earlier cycles. Generally, the developing world has not done very well, mainly because of the weight of external debt piled up during the late 70s and early 80s. Since 1981 there have been hardly any net transfers of resources to the LDCs, and thus the developing world has been virtually

on its own to make adjustments on balance of payments. The process has been painful. These countries have tried to curtail imports. To use the IMF's terminology, there has been 'import compression'. In the last few months, there has been a slight improvement, with non-oil exporting LDCs getting some relief because of the fall in oil prices. On the other hand, however, commodity export prices are in a deep slump and the terms of trade have been moving against the developing world. In this context, what are the implications of the World Bank's recommendation of growth via export-oriented agriculture? Though much of the report is apparently not directed at India or China, but at sub-Saharan Africa, we here have a great stake in what is being advocated. In this note, we shall examine a few important issues raised in the WDR, viz, (i) the relevance of national self-sufficiency in food; (2) the feasibility of agricultural export-led development strategy; (3) the assertion that agriculture is being discriminated against in the LDCs; and (4) whether government intervention in LDC foodgrain markets is worthwhile. On all of these issues our positions differ sharply from that taken in the WDR 1986.

In the course of making its case, the WDR argues that "the general economic policies that developing countries have pursued have ... limited the growth of agricultural production and hampered efforts to reduce rural poverty" (p 61). A notable feature is its emphasis on the relationship between overall macro-economic policies and the agricultural sector, to argue that macro-economic policies have played a negative role. In addition, sector-specific policies (such as pricing and tax policies, government interventions at all stages of production and consumption of agricultural inputs and