Bangladesh

Planning science

Dacca

Better use of the existing facilities and manpower for scientific research and development are given special attention in the Bangladesh government's Second Five-Year Plan, now published. In research and development, priority is given to agriculture, light and heavy industry, energy provision including nuclear power, housing and sanitation and transport.

The contribution of science and technology to the socio-economic development of the country has so far been relatively insignificant. Although Bangladesh boasts about 30,000 scientists and technologists with postgraduate qualifications, some 7,000 engineering graduates and more than 100,000 lower-level scientists, university research has often been "too academic" and in the government establishments research has often duplicated work done elsewhere. In nationalized industries there has been little initiative for innovative research, and in the private sector there has been virtually no research and development work.

Allocation for science and technology in the Bangladesh Second Five-Year Plan

	Estimated budget (in millions of taka*)
Agriculture	2,400
Industry	1,570
Flood control and water resources	750
Transport and communication	210
Health	390
Education	50
Natural resources	260
Nuclear power	1,000
Science, technology and research	1,550
Others	200
Total:	8,380

*US\$1 = 15.30 taka.

Main spending areas in the new plan (see table) are agriculture, industry, flood control and water resources, nuclear power plants and science and technology research. Of the allocation to science and technology research, nearly half of the 1,550 million takas budget goes to the Bangladesh Atomic Energy Commission. The bulk of the rest goes to the Bangladesh Council of Scientific and Industrial Research, the Space Research and Remote Sensing Organization and the Museum of Science and Technology.

The nuclear power programme includes a plan for the country's first research reactor for the production of radio-isotopes, a new 125-MW nuclear power plant in the western zone of the country and a study of the feasibility of extracting nuclear minerals from beach sand.

The space research organization is to concentrate on the completion of Bangladesh's advanced multipurpose

satellite ground station. The station's equipment is to be developed so that it can receive data from the various satellites including CMS (Japan), TROS-N and NOAT (United States) and METEOR (USSR). Important aspects of the satellite-based work for a developing country such as Bangladesh are a natural resources survey and a disaster-warning network. The five-year plan includes policy recommendations aimed at improving links between research centres and industry, improving primary and secondary education and giving further education a more practical bias. **M. Kabir**

Soviet fertilizers

Going it alone

Fertilizer production has been hived off from the Soviet Ministry of the Chemical Industry and now merits a ministry of its own, under Minister Aleksei Petrishchev, previously deputy chairman of the State Committee for Material and Technical Supply. At the same time, a new Minister of the Chemical Industry, Vladimir Listov, has been appointed. He was formerly deputy minister and has been working in the Party Central Committee since 1977.

These changes provide an indication of the direction of Soviet planning in the next five years, coming as they do in the closing weeks of the five-year plan. "Chemicization", as it is called, was launched by Khrushchev in 1958 and was continued by his successors. But Krushchev himself was less fond of chemical fertilizers than of the "virgin lands" — horizon-to-horizon grainfields in the erstwhile uncultivated steppelands of Asia. In 1965, his successors introduced a new agricultural strategy based on increased investment in agriculture, land improvement (drainage and irrigation) and an emphasis on intensive methods of cultivation, increasing the yield per hectare by the use of fertilizers rather than by expanding the total area cultivated.

The expansion of the chemical fertilizer industry was initially heavily dependent on Western technology, particularly the Pullman-Kellogg ammonia system and urea plants. Indeed, much of the capacity of these plants is still being used to pay off the cost of the equipment under compensation agreements.

Recently, however, the Soviet Union has been stressing its independence in all matters of chemical production. To some extent, this may be a reaction to world events. The main raw materials of the Soviet chemical industry are oil and natural gas, and the Gulf war has produced a spate of assurances that there is no oil shortage in the Soviet Union.

Poland is the Soviet Union's main supplier of another raw material vital to the fertilizer industry — sulphur. Political changes there may force Soviet planners to look more seriously at plans to utilize their

own relatively inaccessible sulphur beds.

Irrespective of politics, however, the Soviet fertilizer industry does seem to have reached a stage of relative technological independence. The new Chirchik ammonia plant, for example, is based on Russian technology and Russian contracting.

In spite of official emphasis on increasing the yield of food crops, Soviet agriculture's capacity for fertilizer remains far from satisfied. In 1976 only 50 per cent of the total grain cultivated area received any fertilizer at all.

The setting up of the new Ministry for the Production of Chemical Fertilizers strongly suggests that all branches of the fertilizer industry are to receive a boost in research and development. It also suggests that the forthcoming five-year plan will maintain the current emphasis on the "non-black-earth" regions in the west of the USSR, where the relatively poor soil demands considerable use of fertilizers.

If, as seems likely, the new ministry plans to build more fertilizer plants, the siting of these plants will be a major policy decision. At present, most plants lie in the non-black-earth zone, handy for the market, but far from Siberia, the main source of raw materials. Plants could, of course, be set up in Siberia, but the Siberian economy is in a bad way. **Vera Rich**

European plutonium

Project denied

Brussels

The future of the European Commission's support of research and development on plutonium cycling is in doubt. Last month, after a year-long search for a compromise, the Committee of Permanent Representatives (COREPER) rejected Euratom's second four-year plan even though this had been approved by the European Parliament last May. Officials now seem at a loss to know how an acceptable proposal can be devised.

The first programme ended in 1979 with what the commission described as "highly significant results" and encouraged it to draw up the more ambitious plan for 1980-84 now rejected. A total of 30 million European Units of Account (1 EUA = £0.56) was for research on the environmental effects of using plutonium (including the reprocessing of plutonium fuel), the transport of plutonium, the fabrication of mixed plutonium oxide and uranium oxide fuels and the recycling of used mixed-oxide fuels from light-water reactors.

France and the United Kingdom have led the opposition to the programme while Germany and Belgium have shown the greatest enthusiasm. The French and British are anxious to have cheap plutonium with which to fuel fast-breeder reactors and would rather buy plutonium from fellow member states than use recycled plutonium from their own reactors — the theory being that this would