

which was planned to help meet the need for electric power up to 1985, will also yield irrigation and benefits for the control of floods. The total estimated cost of the project is \$70 million. Canadian consultants studied the feasibility of various alternatives in the mid-1960s and recommended the present idea of a 260-megawatt mixed thermal and hydroelectric power development.

Malaysia, a member of the Commonwealth with more than 10 million people, has been a major recipient of Canadian assistance under the Colombo Plan; Perak is one of its most populous states. Electricity is needed to support the rapidly-growing economy, which is based on tin, agriculture and timber resources and the world's largest production of rubber.

Assistance from Canada has been concentrated on natural-resource surveys and education. Present projects include forestry studies in Sabah, a sawmill training-school in Sarawak and a technical teachers' training college in Kuala Lumpur, the capital.

Consultant services will be provided by the Shawinigan Engineering Company Limited of Montreal under a contract to Malaysia's National Electricity Board.

MINING PRODUCTIVITY

The Economic Council of Canada recently released a report by John Dawson entitled *Productivity Change in Canadian Mining Industries*.

This study of Canadian mining was undertaken to provide background information and analysis for the seventh annual review, *Patterns of Growth*, which attempted to clarify the basic elements of growth in major groups of industries over the past two decades. The seventh review pointed out that output of the mineral industries increased over the two postwar decades at an annual average rate of 8.5 per cent, compared to slightly over 4.5 per cent for the whole economy. It cautioned, however, that widespread attention focused on the rapid growth of "labour productivity" in mining could be misleading because these industries have for some time been very "capital-intensive" and have become much more so during the postwar period. Under those circumstances, it was important to relate output increases more adequately to the increases in all resources used.

This study examines the growth of "factor productivity" – that is, the increases in output other than those accounted for by the changes in labour and capital inputs – in the mining sector as a whole and for individual subgroups of mining industries.

Dr. Dawson points out that the capital per employed person in 1967 dollars increased from less than \$25,000 in the early postwar years to more than

\$100,000 in recent years, with a particularly large rise in the 1960s. As a result, the rate of growth of factor productivity, which had averaged more than 4 per cent a year over the period 1947-57, dropped to a negligible rate of increase over the period 1957-68. The study goes on to examine factor productivity increases for major groups of mining industries over the period 1957-68, and finds that the rates of increase were small for most of them. For the largest group – metal mining – there was no increase, although one of the industries in this group – iron mining – showed a substantial increase. In the mineral fuels group, the rate of increase in factor productivity for the large crude petroleum and natural gas industry was also relatively low in 1957-68.

REASONS FOR LAGGING RATES

A number of reasons for the recent slow rates of productivity increase are suggested. There are long lags between the build-up of investment, including that entailed in exploration, and the subsequent increases in production. In essence, the process that is examined is a dynamic one in which there is a creation of capacity to meet future, rather than merely current, demands. This is a significant aspect in industries such as potash and crude petroleum and natural gas. In addition, developments tending to increase factor productivity may be offset to a considerable extent by the greater amounts of capital employed in exploration and development of lower quality, deeper, or more remote mineral or oil and gas deposits.

CONCLUSIONS

The author concludes that the long-run employment effects of mining activities are not great, although increasingly skilled manpower is required. While there are considerable employment effects during the construction stages, the general increases in employment in mining are not likely to be very significant. Employment may increase in some mineral industries, but such increases will likely be largely offset by further declines in employment in gold mining and in Nova Scotia coal mining. These two industries still accounted for 20 per cent of total mining employment in 1967.

The way in which the mineral industries develop is of special significance to particular parts of Canada, including the Northwest Territories, the Yukon and remote areas in the provinces, because they represent practically the only basis for commercial activity in these areas. New capital-intensive mining developments in remote areas, though not employing large numbers of workers beyond the exploration and development phases, will continue to add new dimensions to the economies of these areas.