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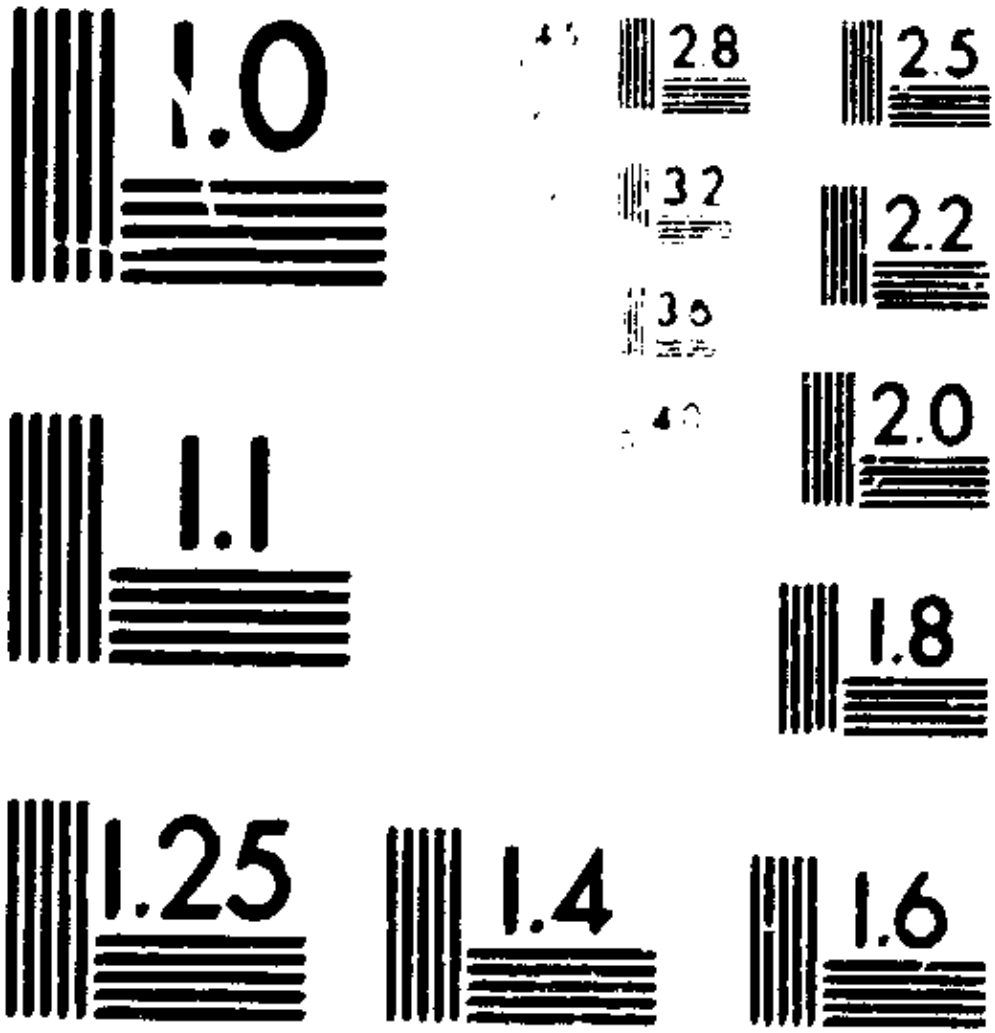
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org



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COMMERCIALIZATION OF RESEARCH RESULTS - ISSUES AND SOLUTIONS*

by

Masud A. Dahir**

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** Joint Secretary, Ministry of Production, Islamabad (Pakistan).

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BACKGROUND

Pakistan is a poor country passing through initial phase of industrialisation to provide plant, machinery and goods for the common needs of its vast population, bulk of which is involved in agriculture or services. The industrial activity is limited and so is the research and development.

2. Most of the research is being done by Government or Semi-Government agencies which have limited means. These focus on the imporvement and adoption of machines, processes, products and production systems. The research effort is not geared to the generation of technology or towards organized innovation. In fact it is at tangent to the bulk of the trade, industry, the commercial practice and the profit direction in which the trading community is involved. Even this negligible effort is circum-scribed by low levels of literacy, understanding and knowledge. Its research organizations lack direction and lose sight of the fact that research results, to be profitable, have to be embodied in products, machinery and equipments, workers skills, in all systems of production and even in systems of distribution and marketing of the products.

INFORMATION & TECHNICAL GAP

One of the important elements missing in R & D Planning and selling research is the inadequacy of business or technical information needed for this purposes. Two types of information generating functions are required for maximising the R & D effort and its sale.

(a) Profit function

To take up in-depth survey of profit oriented major Socio-technological and economic trends and identify fast growing future markets. This can be achieved by promoting free flow of problems of the industries into the R & D organization or by organizing open house laboratories, research industrial meetings, symposiums and seminars, publications and exhibitions.

(b) Marketing and economic evaluation function

Purpose is to undertake studies for

i) selection of the projects

ii) decision making, in order to determine if the results of a laboratory research are worth-while for development into pilot plant or commercial plant. This gap between the research results and commercialization is being filled by greater attention on the desing and working of pilot plant, proto types

and demonstration units.

PILOT PLANTS

However pilot plants cost probably five times more than the project cost at the laboratory stage. It is an un-avoidable step as in a phase of engineering experimentation for new products and processes, it provides a means for :-

i) Adaptation and development of technology required for a new process.

ii) Development of 'turn-key' technologies for small to medium scale industrial process.

iii) To get 'interim' production.

iv) Techno-economic analysis of the project.

v) To provide insurance against making expensive mistakes in commercial scale plant operations.

vi) To convince the entrepreneurs that the new proposal or process is sound.

vii) Studying the effect of changing raw materials, operating conditions, catalysts and for trouble shooting etc., without costly interference with production in existing commercial units.

ROLE OF THE GOVERNMENT

In poorer countries, the Government is the sole initiator of research and development within the overall Science and Technology (S&T) plan. The Governments initiative and intervention may take place in the following shapes:-

i) Establishment of a National Research Development Corporation(NRDC) e.g. U.K. India, Phillipines and Brazil where these institutions licence inventions, make available development finance or absorb losses.

ii) Private Companies are listed to use new technology and produce products which the Government procures till such time the products become economically viable. This is the U.S. approach.

iii) Government funded projects for the purpose of obtaining emperical data or production costs or product performance etc.

iv) Free leasing of the Government demonstration plants used by USA during IInd World War.

v) Fiscal incentives to stimulate in-directly commercialization of research results (CRR) e.g. in Japan one third of the purchase price

paid for plant and machineries required for (CRR) can be added to the ordinary depreciation in the first year and tax relief is provided by allowing expenditure as deductible expense. Pakistan gives limited tax incentives for CRR e.g. lower excise duty is charged on beverages using local concentrate formula. Additional incentives e.g. concesstionary loan of capital, tariff protection, liberal allocation of foreign exchange for raw-materials import will promote the CRR.

ROLE OF FINANCIAL INSTITUTION

The policies of financial institutions in Pakistan do not encourage the CRR. However, in Japan loans having long term re-payment and lower rate of interest are given by Japanese Development Bank to small and midium enterprises and Finance Corporations. Similar incentives may be provided.

INDUSTRIAL SECTOR VS ENTREPRENEURS

The industrialists and entrepreneurs are attracted towards the plants, processes and research results advertised by multi-notionals, because their effort and patent have more credibility and profit than the local R & D. One way to motivate them for using local R&D is to compel them to establish their own R&D units. Cash training grants and

tax concessions may be given to such units. Another way is to fallow and adopt the methodolgy of Korean Technology Advancement Corporatio (KTAC) which takes minorities equity position in new companies based on their invention while the management is under the direction of KTAC new Joint Venture Company.

These are very briefly the issues and solutions for promoting CRR. The best way is that each country may share its experience and adopt some of the tried methodologies in a continuing exercise for optimising the returns on CRR.

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