POLICY BRIEF 1

PRIVATISING AGRICULTURAL RESEARCH

Paucity of public resources for investment and low efficiency of publicly managed systems have focussed attention on fostering greater role for the private sector. In agricultural research too, which has been in public domain since the very beginning, a serious debate has started on the potential role for private sector. In developed countries, the U.S. for example, the private sector accounts for over 50 percent of the total agricultural research expenditures. This brief lays out the theoretical basis underlying private sector research, delineates the potential areas where this can happen, and suggests policy measures needed to promote this.

ECONOMIC RATIONALE

Private investment in any activity is determined by appropriability, that is, the ability of the entrepreneur to capture the benefits arising from such investments, and the expected magnitude of these benefits. Many products of agricultural research, however, have the attributes of "public" goods, that is, benefits are not appropriable. Its use by one beneficiary does not reduce its availability to another. Crop management or new farming system information, generated from research, for example, are universally available to all potential users free of cost. These have social benefits, but no firm can capture any part of this. In this sense there is market failure. So, private sector will not invest in such research and there is no substitute for public intervention.

Generally, however, there is some opportunity for appropriation of benefits and, therefore, some scope for private research. Figure 1 is an abstract illustration of this phenomenon.

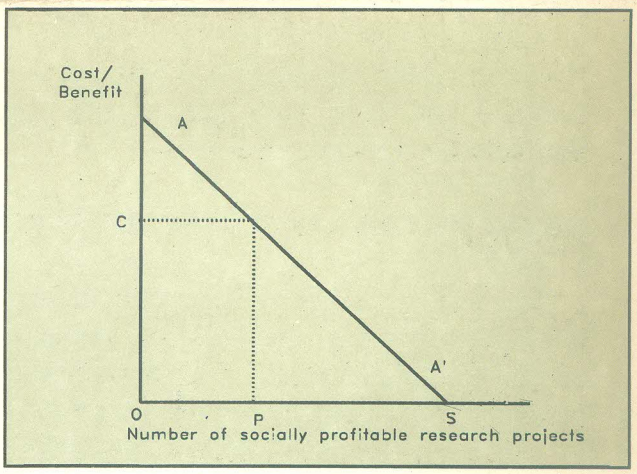

Fig 1. Level of private sector research.

Source: Jarvis L.S. in J.R.Anderson (Ed) *Agricultural Technology : Policy issues for the International Community.* CAB International, U.K.1994(p.260)

The figure shows that there are OS socially profitable research projects. These differ in terms of appropriability, ranging from very high for projects which produce purely private good, to zero for those which produce purely public good. Line AA′ is the present value of appropriable private benefits, and C is the present value of costs of doing these projects. The private sector will undertake only OP projects. More can be done only if appropriability is increased (by patent laws, for example) or if beneficiaries are made to share the costs. The public sector will have to invest and undertake (S-P) projects in order to

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maximize social benefits. Relying exclusively on private sector will result in underinvestment in research.

Many developing countries (including India) had closed economies characterised by severe price, marketing and exchange rate distortions. When such economies are liberalised, there is a sudden spurt in appropriability. Private sector can reap substantial profits with low-cost (largely adaptive) research even in areas where private research would not normally be undertaken. Growth in Chilean fruit industry and exports is a classic example of this phenomenon. Similar opportunities may exist in some exportable commodities in India also. However, such research is contingent upon existence of very high profits and cannot normally be sustained over time.

AREAS OF PRIVATE SECTOR RESEARCH

There is no single criterion to define the boundary between domains of public and private sector research. Opportunities for private sector research vary according to areas of research, type of technologies, farming systems, nature of commodity, etc. The above rationale and international experience (particularly from developed countries) helps in identifying areas of research where private sector has some intrinsic advantage. This is qualitatively illustrated in Figure 2 below in terms of potential under ideal conditions.

The figure shows that in some areas (like chemical, mechanical, processing and information technologies) the private sector has some comparative advantage. It has none or very little in basic research, non-embodied (agronomy, management) technologies, resource conservation, research for subsistence crops and farming systems. In biological technology, its role is limited to hybrids, and patentable bio-products.

The figure also illustrates that public intervention will continue to be critical; there is a large area of research where appropriability conditions would not exist. Even in areas suited for private research, back-up from the public system would be necessary. For example, private sector would not undertake basic research, so essential for breakthroughs in productivity potential. If this does not happen, applied research would cease to generate benefits once the potential is exhausted. Also, private sector research almost invariably builds on methodologies, models, materials and even personnel from the public sector. If it were to start *de novo*, research costs would escalate reducing its optimum research investment (Figure 1). Finally, public sector research is essential to correct the imbalances or biases in private sector research.

The view that privatization will enable reduction in public expenditures on research assumes that the two are substitutes. They are not, and the case for public research remains strong. The two are complementary and understanding the comparative advantage of each helps in avoiding duplication. This division of labour would enable the public sector to move away from some areas and use the resources so freed to focus more on basic research, frontier technologies, sustainability research, and so on.

POLICY IMPERATIVES

Private sector research is nascent is India. Appropriate conditions must be created before a vibrant private system emerges. First, the process of liberalization of the economy, including reforms in the trade and exchange rate regimes, must continue apace. Access to world market creates strong compulsions for domestic R&D on the one hand, and international technology transfer on the other.

Second, massive investment in basic (roads, markets, power, etc.) as well as modern (communication, information, specialized

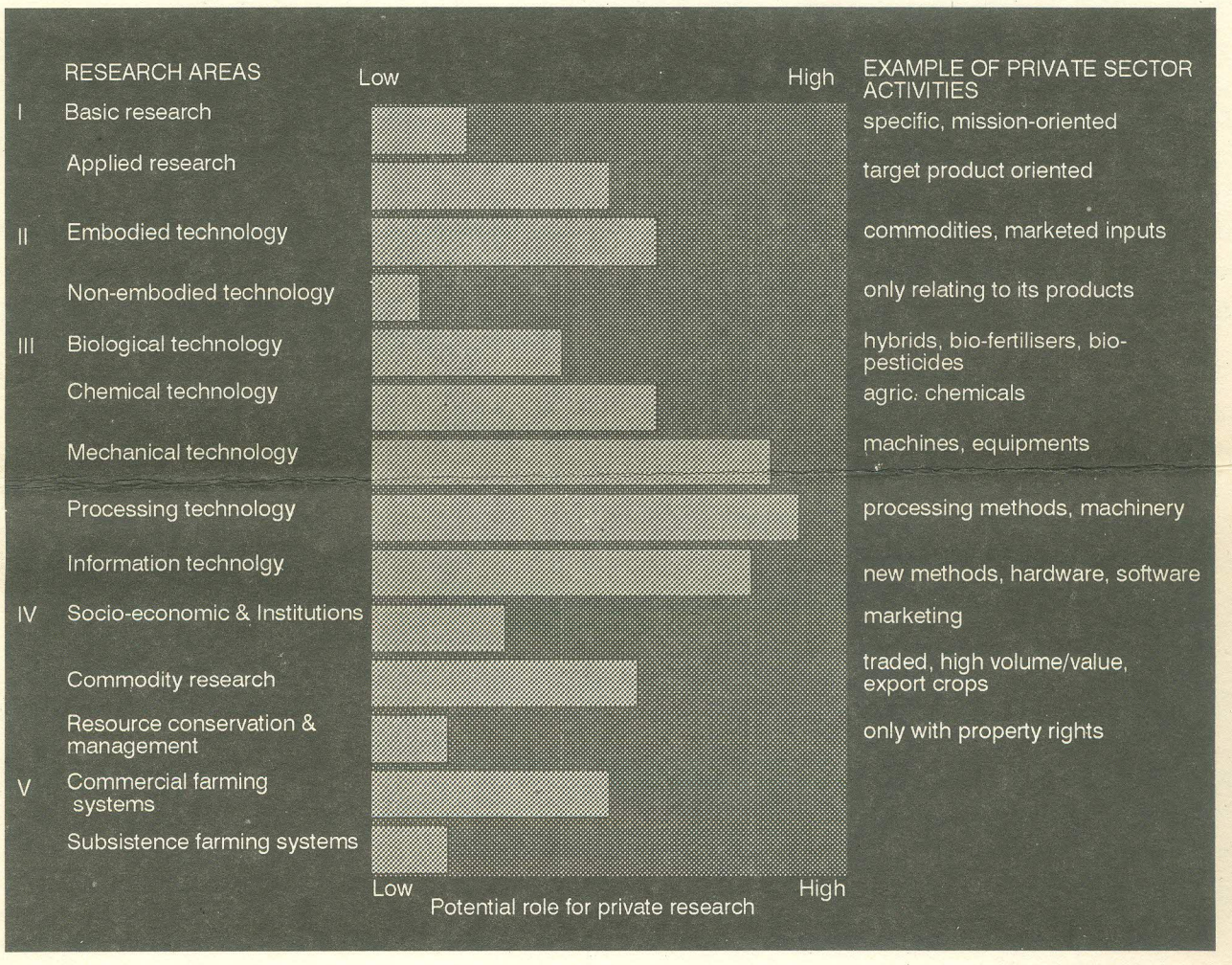

Fig 2. Domains of public and private sector research

transport, cargo, and shipping, etc.) infrastructure is crucial for efficient production and trade. These raise incentives for greater commercialization and improve returns to private R&D.

Third, efficient patenting, registration, copyright and licensing laws are essential. These improve appropriability by making imitation difficult.

Fourth, direct incentives need to be provided to private firms to undertake R&D activities. These may include tax relief, duty concessions on import of scientific equipment and supplies for research purposes.

SOME CONCERNS

Users (farmers) end up paying for the private research. But the latter does not pay for the use of public sector research output. There is perhaps a case for developing protocols to establish some *quid pro quo*. This may take the form of tax exempt annual grants to support basic research in public institutions.

Strong measures must be evolved to regulate import of live materials from abroad either for direct transfer or research purposes. This

applies also to import of agricultural chemicals where developed country MNCs are known to dump hazardous/banned substances in developing country markets. These may even use the developing countries for trials and tests of materials, including altered life forms with completely unpredictable consequences. Allowing complete freedom to private sector could have adverse consequences and these must be guarded against through more stringent quarantine regulations.

Finally, it is well-known that to attain maximum efficiency, technical change in agriculture must be consistent with resource endowments of the country. In our context this implies land-saving and labour-using technologies. However, most developed countries have only capital-using and labour-saving technologies on their shelves. These are suited for large-scale agriculture. The private sector would essentially look to these countries for ideas and technologies. Adaptation and adoption of these themes would discriminate against smallholders (the majority of our farmers) and labour (the majority of our poor).

In conclusion, the national research system is still evolving its perspective as though it is a monopoly supplier of research findings. Hence, themes like value addition, food processing, and hybrid seed production are emphasised in discussions on future research thrusts. In the absence of formal interface with the private sector, the national agricultural research system may completely miss out on complementarities, resulting in duplication of effort.

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