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A FRESH LOOK AT AGRICULTURAL INPUT REGULATION

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The role of the state in agricultural development has shifted considerably in recent years. One of the areas where this reorientation is most noticeable is the organisation of input provision. Seeds, pesticides, and fertilisers are now more likely to be distributed by traders and merchants, rather than by the government input enterprises that dominated the scene until recently. Seed production and variety development are no longer the exclusive domain of the public sector. Government extension and farm credit programmes that were often sources of subsidised inputs have been severely curtailed.

On the demand-side, farmers are more familiar with commercial seeds, fertilisers, and pesticides and are more likely to be the ones choosing inputs and deciding how much to use. Population pressure has led to the intensification of cropping patterns, generating further demand for purchased inputs. Crop diversification and technical change have also contributed to a wider demand for agricultural inputs.

In the midst of these changes in agricultural input supply and demand, the issue of input regulation has often been overlooked. Government involvement in the provision of inputs has been accompanied by a regulatory role that registers and controls the inputs that are available (whether imported or produced domestically) and monitors the quality of those products once they are on the market. There has been considerable concern over how effective or useful government regulatory performance has been in the past, and with a rapidly changing agricultural situation it is even more important that government s role in the regulation of inputs be reviewed. What are the priorities for regulation? When should a government regulatory agency have primary responsibility, and when is it more effective to rely on markets and consumers?

The following discussion begins with several themes that are common to all agricultural inputs. Subsequent sections look at regulatory issues specifically related to three inputs: seeds, pesticides, and fertilisers. The concluding section suggests policy reforms to make agricultural input regulation more efficient.

An Overview of Regulatory Issues for Agricultural Inputs

The costs of inappropriate regulation

There are several possible motivations for the regulation of agricultural inputs. Regulation is often justified when input use implies externalities, such as dangers to the health of farmers or consumers, or hazards to the environment. Such regulation may restrict the use of dangerous chemicals, or may ban seed imports from countries with seed-borne diseases not present in the importing country. A recent study in the Philippines, for instance, showed that when health costs are included in the analysis, the use of dangerous pesticides reduces rather than improves rice productivity (Rola and Pingali, 1993). In addition, regulation is sometimes justified with the argument that the government should perform screening or testing that will direct farmers towards the most appropriate inputs. Finally, regulatory systems often mandate and monitor the quality of inputs that are sold, to ensure they are unadulterated and correctly labelled.

When regulation is effective, it contributes to the development of safe and productive agriculture. But regulatory systems may fall prey to bureaucratic prerogative and may be driven by paternalistic attitudes. Government regulatory bodies are also susceptible to capture by established input providers; in many cases regulation is used to limit competition against government input services, for instance. In such cases of over-regulation, losses are experienced in the form of foregone income or welfare. For example, when the government of Turkey allowed introduction of private maize hybrids in the mid-1980s, national maize yields doubled within several years. The response to regulatory reform in this case suggests that annual foregone gains due to government controls on seed trade had exceeded $100 million in the years before reform.

Thus the consideration of regulatory reform in developing countries must take account of both under- and over-regulation. In many cases, dangerous or inappropriate inputs are allowed on the market, while at the same time inputs that could significantly boost farm incomes or reduce environmental damage are blocked by current regulations. There are considerable costs to establishing the wrong regulatory regime, and many current regulatory systems are having difficulty adjusting to rapid technical change in agriculture and the growth of private input trade. It is important to identify appropriate priorities for regulatory activity.

Recommendations or regulations?

Although the government s aim to protect public health and the environment through regulation is easily justifiable in principle, government regulation of new agricultural technology based on judgements about whether or not the technology would be profitable to farmers raises more questions. In the past, governments bought inputs for resale to farmers, and decisions regarding the choice of product have often relied on government agricultural research, although much of this has been irrelevant for the needs of small farmers. Similarly, most of the crop varieties and seeds available to farmers have, until recently, been the products of government crop breeding programmes and parastatal seed enterprises, and have been subject to government decisions regarding variety release and seed quality.

Thus the roles of government regulation, on the one hand, and agricultural research and extension, on the other, have often been difficult to distinguish. As public sector involvement in input provision diminishes, and with increasing recognition of farmers capacities to select appropriate inputs, the future role of government needs to be reconsidered. Decisions regarding input efficacy will increasingly be left to markets and farmers, while research and extension services will provide information and recommendations.

Alternatives to government regulation

Reconsideration of the government role in agricultural input regulation does not imply an all-or-nothing choice. In situations where small farmers have access to legal facilities, standard commercial law that provides truth-in-labelling with ad hoc product testing may be all that is needed for many agricultural inputs. Some regulatory functions can also be achieved through market mechan-isms, producer or merchant associations, or farmer or consumer organisations. The challenge is to identify which aspects of agricultural input regulation require direct government participation and which aspects can be left to more conventional legal mechanisms or can be the subject of private sector initiative.

Seeds

Until recently the provision of crop varieties and seed has been the exclusive domain of the public sector in many countries. National agricultural research organisations have had major responsibility for the development of new varieties, and the production and distribution of seed of those varieties has often been in the hands of parastatal seed companies. This public sector involvement has brought with it a considerable regulatory component, both in terms of variety registration and seed quality control.

In most countries, public sector varieties are not released for seed production until they have been subjected to a lengthy testing process and have been approved by a variety release committee. The process is meant to ensure that only appropriate varieties are offered to farmers, but often the parameters used to guide testing and release (e.g. yield under good management) are not necessarily congruent with the priorities of many farmers (e.g. ability to be grown as an intercrop). Attention is now turning to methods for improving the effectiveness of public sector crop breeding programmes. Among the proposals are decentralised systems of variety testing that include greater farmer participation in the definition of breeding priorities and earlier farmer access to breeding lines for testing and adaptation.

Commercial seed companies may use varieties developed by the public sector, but may also do their own varietal development. In addition, multinational seed companies are able to offer varieties that have been developed for similar environments in other countries. In many countries, governments have discouraged private sector participation in seed markets, especially for basic food crops. The justification given has sometimes been related to concerns about potential external control of food crop production, but restrictions on private sector participation have often only served to protect public sector research agencies and parastatal seed enterprises from private competition. Even when markets are opened to commercial

seed companies, private varieties are often required to pass through the release and registration procedures designed for the public sector, and the government may ban the sale of seeds of varieties that are not on an approved list. When these barriers to variety introduction exist, they are particularly effective in blocking private variety introduction to small countries (with small markets) and in discouraging small seed companies from being established.

Governments have several options to facilitate the introduction of new varieties. One possibility is to make variety registration voluntary, allowing companies, NGOs, and autonomous public research organisations such as agricultural universities to introduce new varieties without prior government approval. The governments of Chile, Thailand and the US, for instance, allow companies to sell seeds of varieties that are not registered. The government of India requires variety registration only for seeds sold by majority foreign-owned companies. In other countries, such as Australia, Canada, and many developing countries, variety registration is required. Registration is required in EU countries as well, but a common list is maintained, so that a variety approved in one EU country may be sold in other countries without further testing.

It may be politically difficult for a government to abandon variety registration altogether especially for crops that are important to the national economy. But there are opportunities for making the registration process more agile. The variety registration process can take better advantage of commercial seed company test data, for instance. Where countries share similar environments, the possibility of accepting previous test data will facilitate the registration process. The Common Catalogue of the EU functions in this way, and discussions are under way to establish a similar system among the countries of the Southern African Development Community (SADC).

While compulsory variety registration is being debated, the related issue of plant breeders rights is attracting more attention. All governments that are members of the World Trade Organization (WTO) have committed themselves to introduce laws to protect plant breeders rights, and voluntary variety registration is part of this process. But registration for plant breeders rights only involves the assurance that a new variety is distinct (distinguishable from competitors), uniform and stable (DUS), and has nothing to do with performance.

Seed regulations also include seed certification. Certification is an assertion by some agency (public or private) that a particular lot of seed corresponds genetically to the registered variety. Although physical quality of seed (such as germination rate or freedom from weed seed) is a distinct issue, it is often included in certification. In many countries, only certified seed is allowed to be marketed. If the government certification agency has few resources, its coverage will be limited. Where state certification is a requirement for seed sale, opportunities for rent-seeking are often present.

There are several options for reforming seed certification. In some countries including all those with optional variety registration seed certification is voluntary. In these cases the government may offer seed certification or license others to perform this service, and the certification agency must earn its reputation. Two classes of seed may

be sold, certified and truthfully labelled (seed whose characteristics must correspond to those on its container label). Where markets are well developed, farmers buying seed may look for certification depending on their confidence in the certifying agency and in specific seed companies.

Seed producer and vendor associations can assume increasing responsibility for seed quality control, when markets and legal systems allow farmers to express their preferences and pursue complaints. In countries where the commercial seed market is not yet well-developed, the adoption of more appropriate seed certification and quality control standards can be an important step forward. FAO has developed a set of guidelines for Quality Declared Seed that provide quality control during seed production without demanding the resources required for conventional seed certification. Seed regulations should be consistent with a country s resources and should evolve along with seed systems.

Experience in several Latin American countries points to the advantages of decentralised management of seed regulation, with the formation of regional seed boards that include seed producers, farmers and government. Neither commercial nor public seed enterprises will be able to meet all seed demand, and NGO and community-level seed production efforts should be encouragedto develop their own quality control mechanisms.

Pesticides

Virtually all governments have established pesticide regulations although implementation remains a problem in many countries. Regulations cover a wide range of products, including conventional insecticides, fungicides and herbicides, on the one hand, and newer, often safer products such as pheromones (chemicals that attract insects), plant growth regulators, and micro-biological pest control organisms such as bacteria, on the other. Including all of these products in a single category causes inefficiencies in the regulatory process, as will be discussed below.

The registration of pesticides usually takes into consideration the protection of human health (farmers, labourers, consumers), the protection of the environment, and the efficacy of the product. Governments commonly register active ingredients (there are about 750 registered in the US), formulations (mixes of ingredients suitable for sale or use), and products (formulations with a brand name). The registration of a new pesticide is an exceptionally expensive process in OECD countries, and a wide variety of test data is required. Although there is some move towards harmonisation of pesticide regulation in EU countries, complete standardisation will be difficult to achieve. Environmental impact data are difficult to share, for instance, and countries often have their own testing protocols. Recent changes in EU legislation have also encouraged more uniform and transparent registration of new pesticides and have established a review process for products currently on the market.

The situation in developing countries is less clear. Many governments accept data from OECD countries on the health effects of new pesticides, but the continued use of products introduced before registration procedures were instituted, or ineffective management of regulatory systems, means that many dangerous pesticides are on the market. Also, many hazardous pesticides find their major application in tropical

countries and may not be the subject of regulatory experience in OECD countries. The situation is exacerbated by government policies that allow monopolies and oligopolies for locally-formulated pesticides or that provide direct subsidies for pesticides.

Pesticides are the subject of international collaboration in regulation. FAO has established an International Code of Conduct on the Distribution and Use of Pesticides . It includes consideration of products that require Prior Informed Consent ; countries participating in the PIC procedure receive a list of pesticides that have caused particular health or environmental concerns and can then decide whether to prohibit import. The code also requires exporting governments to notify importing countries of shipments of pesticides that are banned in their own country. The code is voluntary however, and depends in part on collaboration from the pesticide industry. No sanctions are applied to exporting countries, although the EU has recently established legislation to support the code. The 1992 UN Conference on Environment and Development called for the implementation of the code by the year 2000.

Health and environmental hazards from pesticide use can be partially addressed by strict enforcement of regulations, and partially by better education and training, but a satisfactory solution must include the development of alternative pest control techniques. The term most generally used to describe these new strategies is integrated pest management (IPM). Common IPM techniques include the use of pest threshold levels to guide control, narrow spectrum pesticides, species-specific attractants, micro-biological and biological control agents, and a broad range of cultural practices. One problem that IPM techniques face, however, is that although some of the new products are safer than conventional pesticides, they must pass through the same regulatory processes as conventional pesticides.

The issue of efficacy testing for pesticides is a difficult one. Most OECD countries require efficacy tests for pesticide registration; the principal exception is the US. Because farming systems and environments vary, it is much more difficult to share data on efficacy, and so countries are likely to have to do their own tests. Efficacy tests are often defended as part of consumer protection, and when a country relies on income from a cash crop such as cotton whose current production practices include high rates of pesticide application, the government wants to make sure that effective products are being used. On the other hand, insistence on efficacy testing may delay the introduction of new products, such as those associated with IPM, and ignores farmers capacities to experiment and choose among competing products. The development of alternative pest control technologies for developing countries will rely heavily on public research, extension programmes, and farmer participation. Regulations should allow farmers, researchers and extension agents to experiment with as wide a range of acceptable products as possible.

Since pesticides (unlike seeds and fertilisers) are inherently dangerous, governments not only register products, but also regulate production, trade and application. In most cases, pesticide approval includes assumptions about its field management. In some developing countries, farmers may be unable to follow safety procedures that are standard in wealthier countries, and this will affect regulatory decisions about particular products. Another priority is the establishment of pesticide residue limits and the monitoring of residues in food. There is significant under-regulation in this area in most developing countries. Pesticide quality control can also be important,

particularly since some contaminants can have serious health and environmental impacts. Smuggling, mixing and selling of illegal pesticides can also be problems. Building local capacity to assume some responsibilities for monitoring the sale and use of pesticides may be more efficient than relying on a large centralised regulatory agency in certain cases.

Fertiliser

Chemical fertiliser accounts for the largest share of import trade in agricultural inputs for developing countries. Structural adjustment policies have caused significant shifts in fertiliser distribution in recent years. Governments have cut subsidies and have largely stopped distributing fertiliser through extension and credit programmes. In many countries, however, the transition from public to private fertiliser trade has not been smooth. Private traders may need some initial support to acquire the credit and experience necessary for managing fertiliser marketing. In addition, government and donors often promote privatisation before deregulation, and the range and quantity of products that merchants have to offer is not sufficient to support a strong, competitive market.

In many cases, governments still control fertiliser supply by allocating foreign exchange and import permits, regulating not only quantities but also types of fertilisers allowed for import. The fertilisers permitted to be imported are often limited to specific sources of basic nutrients, and import regulations may deny farmers access to sources of other important soil nutrients. Fertiliser import restrictions impede farmers, researchers, and merchants from exploring the full range of soil management options appropriate for evolving farming systems.

Fertiliser is an input that allows considerable farmer experimentation, and there is much evidence to support the view that farmers are able to arrive at economically efficient fertiliser practices through their own experience. Removing barriers to fertiliser import and trade and eliminating regulations for type or composition of fertiliser would help establish a wider range of products from which farmers can choose. Governments can enforce quality standards through truth- in-labelling legislation.

A more dynamic fertiliser market needs to be complemented by continued research on soil fertility management. As fertiliser prices increase, and as cropping patterns become more intense, there is increasing pressure for more precise fertiliser management, the increased use of micronutrients, and combinations of organic and inorganic fertilisers. It is unlikely that the private sector will be able to provide very much of this information, because the results are location-specific and often the benefits cannot be captured by private firms. Consistent with regulatory reform, government research information on soil fertility management options can be communicated as advice rather than prescription.

Policy Implications

The preceding discussion suggests a number of possibilities to improve the effectiveness of agricultural input regulation in developing countries:

a. Government regulatory agencies need to set priorities carefully. Over-regulation often serves only to protect public sector enterprises and is responsible for blocking the introduction of new varieties and inputs that could contribute to more efficient production. As a general rule, the focus should shift away from testing product efficacy and towards prevention of negative externalities, paying particular attention to health and environmental protection. Monitoring of product quality should concentrate on areas where abuse is prevalent and where the dangers from mislabelled or adulterated products are particularly severe.
b. Developing countries can reduce the expense of regulation by sharing data. The idea that each country should generate its own data before deciding on the status of a particular input is very inefficient. Crop varieties or chemicals that have proven useful in similar environments need not be subjected to extensive trials, especially if research information is widely shared. Regional collaboration to harmonise regulations and to establish common lists of registered inputs will promote regulatory efficiency.
c. Regulatory reform that removes the authority of public sector scientists from prescribing agricultural technology does not challenge the importance of public agricultural research and extension. Close communication between the public and private sectors is needed to identify the types of research and the channels of information dissemination where the private sector is likely to under-invest, as well as areas where public-private collaboration will be most effective. Greater participation from farmers in the research process is also required.
d. Regulatory reform does not mean that the government has no strategy for quality control. Input producer and vendor associations should be encouraged to provide internal quality control. Support should be given to simple and effective methods of identifying product brands and firm names, to contribute to consumer awareness and the establishment of enterprise reputations. To the extent possible, input regulation should rely on standard commercial law and practices, such as truth-in-labelling and trademarks.
e. In some situations, devolving specific regulatory authority to sub-national authorities may be a more efficient way of achieving regulatory goals. Examples might include local licensing for pesticide dealers or the establishment of regional seed boards.
f. Farmers own capacities for contributing to regulatory responsibility can be strengthened. Community organisations and farmer groups can be trained in simple methods to monitor the quality of inputs available to them. Initiatives that increase farmer awareness of pesticide safety issues should also be supported.
g. Finally, allowing regulations to evolve enables regulatory systems to remain efficient. Regulatory priorities shift over time with technology, cropping patterns, and markets. Regulatory agencies should contribute to an effective agricultural input policy that stimulates the competition that will provide farmers with the widest possible range of options.

Further Reading

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