MARKET FAILURES AND POLICY FAILURES

Session 4

Objective: To introduce the concept of market failures and policy failures, and present an exercise applying the concept.

Summary: The market equilibrium for goods and services establishes market clearing prices. When dealing with the environment, policy, institutional, and market failures result in excessive environmental damage or resource use, usually because prices (or policies) send the wrong signals. Correcting prices and/or policies for various types of failures is often beneficial to the environment because the corrections provide real scarcity signals that help in the correct allocation of resources. In cases of market failure, the perceived price does not reflect the real value of the resource (in either a positive or negative sense). The valuation of non-market goods and services is an important element in identifying, and correcting, market failures. Policy failures occur when policies encourage inappropriate behavior. Policy failures usually also result in market failures.
Introduction

4.1 Markets and policies fail when they send the wrong signals and cause environmental damage. In most cases these failures are not conscious decisions. Markets fail when certain values are not included in prices (or are ignored) and consequently prices do not send correct messages about the true value of a resource, or the true extent of damage caused by an action. (For example, ignoring the carbon sequestration benefits of increased tree planting will result in too few trees being planted.)

4.2 Policies fail when they are implemented (often for very good reasons) and create unintended and usually negative environmental side effects. (For example, an earlier policy to encourage land settlement and colonization in the Amazon required that land be cleared to establish ownership, thus discouraging other, less forest destructive forms of tropical forest management.) Institutional failures are another form of policy failure. Since policy failures also result in inappropriate signals, they often are felt as market failures.

Policy Failures

4.3 Subsidies, taxes, tariffs, quotas, and many other policy interventions (such as grandiose public investments) are often made with the intention of improving social welfare. The goals of increased employment, adequate food supplies, or the protection of domestic industry may be well intentioned but are often economically inefficient. In some cases, the result is a shift to the right in the supply curve of many products and services that are derived from natural resources whose input prices have been artificially lowered. This leads to resources over-use, often with negative environmental externalities. For example, low energy prices increase acid rain and the amount of CO\textsubscript{2} contributing to global warming.

4.4 Countries have institutions and legal structures to govern the use of natural resources and protect the sink functions of ecosystems. One of the most important legal structures relating to natural resources is property law. Institutions are important to set the rules of natural resources management and to insure that they are adhered to by other institutions, communities and the private sector. They also have an important regulatory role with regard to environmental impacts, including pollution control and emissions standards, licensing and permit laws, concession terms, tenant arrangements, and so forth. In all these functions, transactions have to be minimized for markets to function properly.

4.5 Some regulations have direct effects on natural resources and the environment, but most do not have a clear effect and the measures proposed need careful scrutiny. Export restrictions of unprocessed logs to promote domestic wood processing and protect the environment, for instance, can reduce log prices and encourage waste or other inefficiencies instead of slowing deforestation.
4.6 Defined property rights in the case of open-access resources such as grazing grounds, communal forests, or coral reefs, is important for sound resource management. Institutional failure occurs when a government does not establish and enforce property rights when it is technically possible to do so. Owners’ rights and responsibilities, including rent or tax payments, have to be respected in order for markets to function properly and for prices to accurately reflect the value of resources.

4.7 Another form of policy failure is inefficient taxation of economic rent. Timber fees on public lands need to reflect the full value of that resource. Ensuring that stumpage prices on public land are adequate requires a good and updated database on all the factors necessary to calculate timber residual values. If non-timber values and sustainability constraints are not well-documented, stumpage prices will be wrongly assessed. Some taxes need to be assessed also to bridge the gap between social and private net benefits.

4.8 Information can help people do the right thing for sustainable development. The first step in internalizing an externality, or avoiding it altogether, is to become aware of the nature and extent of that externality. Information on the environmental costs of certain activities can help in comparing economic and environmental choices, and making better decisions. Insufficient dissemination of information is therefore an institutional failure.

**Market Failures**

4.9 Market failures usually occur because of externalities. In this case, the equilibrium market prices fail to reflect the true social costs and benefits of resource use. In competitive markets, the price of any good equals the private marginal cost of producing it. At market clearing prices, marginal cost equals marginal revenues. However, resource extraction may give rise to external costs. Timber exploitation may contribute to soil erosion and affect farmers downstream. If property rights are not clearly defined and enforced, scarcity rents are dissipated. In these cases, market prices do not accurately reflect resource scarcity and resources are used inefficiently and are misallocated.

4.10 Many market failures contribute to environmental degradation. Markets may not exist or be incomplete for many environmental goods and services. Transaction costs (information, negotiation and monitoring) may be high and preclude environmentally beneficial exchanges. Uncertainty and risk may shorten planning horizons of private actors so could their high opportunity costs of capital resulting from an inappropriately regulated capital market. The main general types of externalities are public goods or bads, open access, and intertemporal externalities. Each of those externalities generates market failures that should be internalized by appropriate environmental policy tools (usually changing prices in some manner).

4.11 Public goods are characterized by non-rivalry in consumption and non-excludability features. Consumption by one person does not reduce the quantity available for others, e.g.,
landscape viewing. “Non-excludability” means that nobody living in the area can be excluded from the good or bad effects of the environmental benefits or costs. Air pollution is an example of public bad. It is considered non-rivalry in consumption since the entry of another person in the polluted area does not change the impact of pollution on any individual living in it. It is also non-excludable because nobody living in the area can be excluded from the effects of pollution.

4.12 Public goods/bads are difficult to internalize because the cost of maintaining the public goods or suppressing the public bads is hard to compute. Beneficiaries hope that others will pay the costs for “free-riding” behavior. Mechanisms used to internalize these externalities include: trade restriction, air and water quality standards, and the establishment of nature/park reserves. Alternatively, economic instruments such as taxes and subsidies can be used to encourage production of the public good. Institutional responses are needed to administer these regulations and incentives.

4.13 A second major type of externality are those associated with open access resources. The existence of clear property rights is needed to ensure an efficient market clearing price. If such rights do not exist, the price of the resources may stay constant until the resources are exhausted. The price will give no indication of the gradual disappearance or destruction of the resource. To internalize this type of externality, the owners of the resources should have clearly defined property rights so that any losses, profits, and rents from managing the resources would be theirs. The rights should be enforceable and the land and resources should be transferable, i.e., should be bought and sold on the markets with minimum transaction costs.

4.14 Lastly, intertemporal externalities are those which occur over time and affect future generations. The intertemporal market failures may occur because the benefits of certain operations (e.g., the use of a resource) are experienced by the present generation, while their cost will be borne by future generations. This occurs because of the uncertainty surrounding the benefits that future generations will require. For example, will they need open space? It also occurs because of time preferences. People discount future benefits because they prefer to have things now rather than in the future. But society has a much longer time horizon and cannot discount future benefits as an individual does.

4.15 When external effects occur, such as those described above, market prices do not reflect the full social costs and benefits of production and consumption. Table 4.1 summarizes the impact of externalities, i.e., market failures, as they relate to the supply and demand, and costs and benefits, of various goods and services that have/generate externalities.

4.16 Non-competitive markets, characterized by monopoly and oligopolies (as well as those monopolies and oligopolies created by poor market policies), will result in market failures. Prices will not reflect the true social costs of the outputs and inputs. In project analysis, these inputs and outputs will have to be shadow priced accordingly.
Table 4.1 A summary of the Impact of Externalities

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<thead>
<tr>
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<th>Negative Externality</th>
<th>Positive Externality</th>
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<tbody>
<tr>
<td><strong>Quantity Produced</strong></td>
<td>Too much</td>
<td>Too little</td>
</tr>
<tr>
<td><strong>Costs/Benefits</strong></td>
<td>Costs greater than socially optimal</td>
<td>Benefits less than socially optimal</td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td>Too low</td>
<td>Too high</td>
</tr>
<tr>
<td><strong>Stimulus to Innovate</strong></td>
<td>Little incentive to reduce social costs</td>
<td>Little incentive to expand social benefits</td>
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4.17 All the above policy and market failures usually justify some form of public or collective action, provided that the costs of correcting these imperfections does not exceed the potential welfare benefits to be gained. Instruments to redress policy and market failures will be presented in sessions later.