

Chapter 2.

Olga Bychkova, Categories of Goods in Economics and Public Choice Literature, Applied to Heat and Water Utilities

The nature and division of goods

There is no common agreement about the definition of a good in economic literature. Moreover, a “good” and a “thing” are usually considered as the same category. In economics, a good is anything that can be consumed or increases utility and therefore can be sold in a market. It can be thought of as only a physical object/thing that is visible (e.g. in macroeconomics and accounting), or it can be both a tangible object/thing and an intangible service (e.g. in microeconomics) (Menger 1950, Gould and Ferguson 1980). Carl Menger, the founder of the Austrian school of economics, suggested the following distinction between things and goods:

Things that can be placed in a causal connection with the satisfaction of human need we term useful things [*Nutzlichkeiten*]. If, however, we both recognize this causal connection and have the power actually to direct the useful things to the satisfaction of our needs, we call them goods. If a thing is to become a good, or in other words, if it is to acquire goods-character, all four of the following prerequisites must be simultaneously present:

1. A human need.
2. Such properties as render the thing capable of being brought into a causal connection with the satisfaction of this need.
3. Human knowledge of this causal connection.
4. Command of the thing sufficient to direct it to the satisfaction of the need

Only when all four of these prerequisites are present simultaneously can a thing become a good. When even one of them is absent, a thing cannot acquire goods-character [*Guterqualitat*], and a thing already possessing goods-character would lose it at once if but one of the four prerequisites ceased to be present... (Menger 1950, 52)

Thus, tangibility of a thing, so important for our project that examines the infrastructural aspect of politics, hardly matters for economics. However, Menger also suggested classifying goods into true and as imaginary. Such distinction was noted by Aristotle (*De Anima* III.10. 433a 25-38) and was based on whether the need arises from rational deliberation or is irrational:

A special situation can be observed whenever things that are incapable of being placed in any kind of causal connection with the satisfaction of human needs are nevertheless treated by men as goods. This occurs (1) when attributes and therefore capacities, are erroneously ascribed to things that do not really possess them, or (2) when non-existent human need are mistakenly assumed to exist. In

both cases, we have to deal with things that do not, in reality, stand in the relationship already described as determining the goods-character of things, but do so only in the opinions of people... Among things of the second class are... the implements, statues, buildings, etc. used by pagan people for the worship of idols, instruments of torture and the like. Such things, therefore, as derive their goods-character merely from properties they are imagined to possess or from needs merely imagined by men may appropriately be called imaginary goods. (Menger 1950, 53)

Following Menger, contemporary public policy studies define goods very widely: as “any thing from which individuals may potentially derive satisfaction or pain” and as “all the different products and services that may be consumed, exchanged sold or made available in a society” (Bickers and Williams 2001, 68 and 119).

In economics, it is common sense to divide all goods into private, club, common and public goods. Discussion of the topic usually follows considerations of market failures and externalities.¹ Two attributes of goods lie at the foundation of this classification: 1) Whether there is competition involved in obtaining a given good or in other words, whether this good is finite or infinite, or whether “the marginal cost of providing a good to an additional consumer is zero or not” (Pindyck and Rubinfeld 2001, 621). 2) Whether it is possible to exclude anyone from consumption of a given good and what the costs to do that are. In literature, these properties are conventionally called rivalrousness and excludability (Musgrave 1973, Luenberger 1995, Pindyck and Rubinfeld 2001).

Tables that appear below present classification of goods, coming from two main sources. First, they rely on Richard Musgrave and his by now classic work, which divided goods into four cases, according to their consumption and excludability characteristics (Musgrave 1950, 57). As Musgrave stated, the market can function only in a situation where the “exclusion principle” applies:

Where A’s consumption is made contingent on A’s paying the price, while B, who does not pay, is excluded. Exchange cannot occur without property rights, and property rights require exclusion. Given such exclusion, the market can function as an auction system. The consumer must bid for the product, thereby revealing preferences to the producer, and the producer under the pressure of competition, is guided by such signals to produce what consumers want (Musgrave 1950, 55-6).

¹ For example, in Bickers and Williams (2001), the section about public goods is titled “Limitations of the market” and follows the section “The market as a collective action mechanism,” and in Pindyck and Rubinfeld’s textbook (2001), it is included in the section “Information, market failure, and the role of government”.

For private goods, “the benefits derived therefrom flow to the particular consumer who pays for them. Thus, benefits are internalized and consumption is rival” (Musgrave 1950, 56). However, if consumption is nonrival and/or if exclusion cannot be applied, market fails to function efficiently.

Table 1. Musgrave’s classification of the goods.

CONSUMPTION	EXCLUSION	
	Feasible	Not Feasible
Rival	1	2
Nonrival	3	4

Source: Musgrave 1950.

As Musgrave explains the difference,

Characteristics of case 1 depict the clear-cut, private-good case, combining rival consumption with excludability. This is where provision through the market is both feasible and efficient. In all other cases, market failure occurs. For the setting reflected in case 2, market failure is due to nonexcludability or high costs of exclusion, which for the setting of case 3 it is due to nonrival consumption. In the fourth case, both impediments are present. If we applied the term “social good” to all situations of market failure, cases 2, 3 and 4 would all be included. It is customary, however, to reserve the term for cases 3 and 4, i.e. situations of nonrival consumption” (Musgrave 1950, 57-8).

The second table depicts the classification of the goods common for current economics and public choice textbooks. It categorizes goods based on two criteria: competition and exclusion from consumption.

Table 2. Classification of goods in public choice literature.

	EXCLUSION	EXCLUSION
	easy	difficult

<p>COMPETITION</p> <p>Rival/ Finite</p>	<p><i>Private goods</i> (finite good produced for profit)</p> <p>Food, clothing, cars</p>	<p><i>Common goods</i> (finite natural or human-produced good with free access) or Common pool resource (subtractable natural or human-made resource with free access, which, as a result, are likely to be overused) Good that “cannot readily be fenced” (Hardin 1968, 1245) Water, fish, pasture, system, animal populations)</p>
<p>COMPETITION</p> <p>Non-rival/ Infinite (marginal cost of production to a consumer is zero)</p>	<p><i>Club goods</i> (infinite goods, which can be excluded from consumption, if using special techniques and technologies, or “goods available for consumption to the whole membership unit of which the reference individual is a member”)</p> <p>Cable television</p>	<p><i>Public goods</i> (goods, from which all members of a group benefit if any one member receives the benefit)</p> <p>Clean air, national defense, lighthouse, beautification projects, protection</p>

Source: Hess and Ostrom 2003.

According to literature, peculiarities of the common, club and public goods are the following. Most attention was always dedicated towards the definition of public goods. Thus: “The benefits from a public or social good, unlike those from a purely private good, are seen to involve external consumption effects on more than one individual. By contrast, if a good can be subdivided so that each part can be competitively sold separately to a different individual, with no external effects on others in the group, it isn’t a likely candidate for government activity” (Samuelson 1980, 151). Other definitions of public goods include: “goods that benefit all consumers, but that the market either undersupplies or does not supply at all” (Pindyck and Rubinfeld 2001, 621); “those consumer goods having the property that, once produced, their enjoyment by each and every individual does not reduce their availability for the enjoyment of others” (Strotz 1958, 329); “good or service which is available to all” (Parsons 1995, 10); good that “is not really consumed, it is just used” and “a good that must be consumed in identical

amounts by everyone”(Luenberger 1995, 290); “a good is public if it is by nature available to all; if one man uses it, everyone can use it” (Feldman 1980, 107).

Less theorization was spent on club goods. But if we take Cornes and Sandler (1986, 159-161), we learn the following. Four unique aspects of club goods make them different from pure public good: 1) unlike public good, which can be involuntary, clubs must be voluntary; members choose to belong because they anticipate a benefit from membership. The right of exist is always available for the case of club good. 2) Clubs share partially rival public goods, like recreation facilities, tennis clubs, and swimming pools. 3) The main feature of clubs is the presence of an exclusion mechanism, where users’ rates of utilization can be monitored and nonmembers and non-payers can be barred. 4) Clubs are also characterized by dual decisions – membership decisions (who can participate) and provision choice (how much of the shared good must be produced). In case of pure public goods, only the provision decision should be made; membership is the entire population.

Finally, the main problem of common goods is their size or other physical characteristics, which makes it costly but not impossible to exclude individuals from consuming them. Unlike pure public goods, common goods can be overused and polluted unless use limits are enforced. The common good consists of the stock variable (a core resource that regenerates the fringe variable and thus should be protected) and the flow variable (a limited quantity of extractable fringe units of a core resource that can be consumed).

One should note, however, that there are some problems with the exposition above. First, there is no agreement on common exact titles of kinds of goods in economic literature. For instance, Musgrave (1950) and Strotz (1958) called public goods social goods, and Samuelson (1954) called them collective goods (while nowadays it is tradition to define collective and social goods as a separate category; see section below). Bickers and Williams (2001) present club goods as toll goods (i.e. individuals may have an incentive to produce such goods and charge for their use).

Second, there are also different interpretations of the relationship between these four goods categories. Club and common goods are sometimes included in one broad definition of public goods. In this case, goods are classified based on their capacity to be provided through the market (Musgrave 1973, 57). Goods are then treated as either private (finite and excludable goods that can be sold in a market) or public (all other goods with some problems if trading at a market, i.e. cases of market failures, including club, common and public goods from the last

table). Goods can be also classified depending on consumption or reproduction status. In this case, they are either finite or infinite goods (Musgrave 1973, 58). Public goods here include only club and public goods from the last table, that is, non-rival goods. As Musgrave argued, their main difference from common goods (rival non-excludable good) is determined by different conditions of efficient resource use (Musgrave 58). There is also classification of goods as pure private goods, pure public goods, and all others (“the intermediate public goods” (Colm 1956)) or “mixed goods” (Samuelson 1958).

Moreover, there are also great debates about certain categories of goods that can be placed in more than one of the above types. A given type of good can be interpreted as another by different authors. For instance, while one researcher can consider, say, a television broadcast as a public good, another can argue that given technological innovations of decoders and scripts, anyone with special equipment can be excluded from the broadcast and thus, this good is a club or even a private good (Samuelson 1958, Pindyck and Rubinfeld 2001). Fresh air can be considered both as a common and public good. It is nonexclusive and often nonrival, thus a public good, “but it can be rival if the emissions of one firm adversely affect the quality of the air and the ability of others to enjoy it” (Pindyck and Rubinfeld 2001, 645), thus, a common good. Lighthouses are often used as the classical example of a public good. However, as Ronald Coase demonstrates, they can be easily transferred to the category of club goods. Since most of the benefits of a lighthouse are received by ships using particular ports, lighthouse maintenance fees can often be included in port fees (Coase 1974).²

To sum up, while economic studies conventionally divide goods into four groups, the boundaries between these groups are too flexible. They are imposed by a particular researcher rather than derived from the nature of a thing itself.

History of classification

² However, Samuelson argues that making lighthouses a club good would be inefficient. “The fact that the lighthouse operators cannot easily appropriate a fee, in a form of a purchase price from those it benefits, certainly helps to make it a suitable social or public good. However, even if the operators could claim a toll from every nearby user, that fact would not necessarily make it socially optimal for this service to be provided like a private good at a market-determined individual price. Why not? Because it costs society zero extra cost to let one extra ship use the service; hence any ships discouraged from those waters by the requirement to pay a positive price will represent a social economic loss – even if the price charged to all is no more than enough to pay the long-run expenses of the lighthouse” (Samuelson 1980, 151).

As indicated in some textbooks (e.g. Luenberger 1995), the basic theory of public goods is usually ascribed to Paul A. Samuelson. However, as Samuelson himself indicated, many other economists before him were concerned with the problem of public, or as they called them, collective or social goods. A first reference to the notion of public goods can be found in Adam Smith's *The Wealth of Nations*. He indicated that there are public goods that can be produced only by the state:

The sovereign's duty "is that of erecting and maintaining those public institutions and those public works, which, though they may be in the highest degree advantageous to a great society, are, however, of such a nature, that the profit could never repay the expense to any individual or small number of individuals, and which it therefore cannot be expected that any individual or small number of individuals should erect or maintain" (Book 5).

Smith's ideas were neglected for nearly an entire century and returned to economic theory only at the end of the 19th century. Emil Sax, an Austrian economist, suggested the classification of goods based on the principles of divisibility and defined "a common product, the indivisibility of which does not interfere with individual benefit evaluation, e.g. a theatrical performance" (Sax 1887, 208; cit. from Musgrave 1939, 218-9). Sax also suggested distinguishing between two kinds of collective needs: "those for which a specific benefit share can be imputed to the individual" and "collective needs proper" "where such individual shares cannot be determined" (Sax 1924; cit. from Musgrave and Peacock 1958, 178).

Other fathers of the theory of public goods are Ugo Mazzola, an Italian economist, and Kurt Wicksell, an Austrian economist, who discussed the formation of the prices of the public goods (though they did not explain the concept itself and did not make any references) (Mazzola 1890, Wicksell 1898). Another Italian economist, Giovanni Montemartini (1900) discussed the concept of public or collective needs and argued:

There are no public, or collective, needs in the strict sense of the word, as opposed to private needs. It is always real individuals who calculate the advantages of imposing on the community the production of certain specific goods... historically, the so-called public or collective need vary; no collective need can be said to be of a universal character in space and time. Thus the test of history also confirms us in the opinion that it is fallacious to consider that satisfaction obtained collectively necessarily derive from the special nature of needs which are termed collective" (Montemartini 1990; cit. from Musgrave and Peacock 1958, 151).

Montemartini, like previous scholars, did not refer to previous studies of public needs and goods, as not many comprehensive studies were yet in existence. Another Italian economist,

Enrico Barone (1912) continued the same issue and noted the existence of “a general need” (for example for bread) and “a collective need” (for example for internal security). Like Sax (while Barone did not refer to Sax’s research), he used the principle of divisibility as the basis of classification of goods and stated,

We shall call public needs those for which the State provides in any given country and at any given time... Public needs so defined can be divided into two great categories: those which are, and those which are not susceptible of individual and specific demand and divisible supply. Railways and postal services fall into the first category, foreign defense and security into the second (Barone 1912; cit. from Musgrave and Peacock 1958, 165).

Among English-speaking authors, Howard Bowen was one of the first economists who suggested the classification of goods. As he indicated in a 1943 paper:

Economic goods are of two types: individual goods and social goods. The two types are similar in that each serves the need of human beings and each is produced only through the use of scarce resources. They differ, however, in the character of their demand. Individual goods are characterized by *divisibility*. They can be divided into small units over which particular persons can be given exclusive possession (e.g. carrots, sewing machines, barber services)... Social goods, on the other hand, are not divisible into units that can be the unique possession of individuals. Rather, they tend to become part of the general environment – available to all persons within that environment (e.g. education, protection against foreign enemies, beautification of the landscape, flood control)... Social goods... are subject to collective or political rather than individual demand (Bowen 1943, 27).

Bowen also stated “no comparable body of theory exists for social goods” and has not suggested any references for the previous tradition, from which he derived his types of goods.

Divisibility and the concept of public goods in neoclassical economic theory.

As I already said, Samuelson is conventionally considered as the first to introduce the concept of “public goods” into neoclassical economic theory. He developed this theory in three papers. In a 1954 paper, he introduced the concept of public, or as he called it, social goods. His main criterion for classifying goods was physical divisibility, which later on was formulated as the non-rival property. He assumed that there are two categories of goods: private consumption goods, “which can be parceled out among different individuals,” and collective consumption goods, “which all enjoy in common in the sense that each individual’s consumption of such a

good leads to no subtraction from any other individual's consumption of that good" (Samuelson 1954, 387). However, in this paper he did not refer to previous research or tradition, where similar categorization has been already suggested (with the exception of the following statement right at the beginning of the paper: "Except for Sax, Wicksell, Lindahl, Musgrave and Bowen, economists have rather neglected the theory of optimal public expenditure, spending most of their energy on the theory of taxation" (Samuelson 1954, 387)).

Later on, answering to critical reviews (see Margolis 1955 and Colm 1956, who indicated the limited applicability of Samuelson's model), Samuelson suggested further clarifications to his categorization. In his 1955 paper, he explained that his main goal was to present "a mathematical exposition of a public expenditure theory that goes back to Italian, Austrian, and Scandinavian writers of the last 75 years" (Samuelson 1955, 359) and referred to the previous studies that developed the similar ideas:

In terms of the history of similar theories, I hope the present paper will make clear relationships to earlier writers... I shall not bore the reader with irrelevant details of independent rediscoveries of doctrine that my ignorance of the available literature may have made necessary. Yet is it presumptuous to suggest that there does not exist in the present economic literature very much in the way of "conclusions and reasoning" that are, in Dr. Margolis's words, "familiar"? Except for the writers I have cited, and the important unpublished thoughts of Dr. Musgrave, there is much opaqueness in the literature (Samuelson 1955, 355).

He restated the distinction between a private consumption good ("like bread, whose total can be parceled out among two or more persons, with one man having a loaf less if another gets a loaf more") and a public consumption good ("like an outdoor circus or national defense, which is provided for each person to enjoy or not, according to his tastes") (Samuelson 1955, 350). He also recognized the extreme polarity of the suggested classification and noted that "many – thought, not all – of the realistic cases of government activity can be fruitfully analyzed as some kind of a blend of these two extreme polar cases" (Samuelson 1955, 350).

In a 1958 paper, Samuelson returned to the same topic and presented his vision of the history of state and public goods:

Once upon a time men on this planet were all alike and very scarce. Each family hunted and fished its symmetrical acres; and each ended with the same production and real income. Then men turned to cultivating the soil and domesticating animals. This left even more of the globe vacant, but did not disturb the symmetry of family incomes. But finally population grew so big that the best free land was all occupied. Now there was the struggle for elbow room. According to the scenario as I choose to write it, the struggle was a gentlemanly one. But men did

have to face the fact that recognizing squatter's rights and respecting laissez-faire did result in differences of real incomes among families. Here then for the first time, government was introduced on this planet. A comprehensive program of redistributing income so as to achieve a maximum of the community's social welfare function was introduced (Samuelson 1958, 332-333).

In this paper, he also suggested that scholars "go beyond the polar cases of (1) pure private goods and (2) pure public goods to (3) some kind of a mixed model which takes account of all external, indirect, joint-consumption effects" (Samuelson 1958, 335).

In his textbook "Economics," while analyzing public goods, Samuelson again repeated his references to "the nineteenth-century analysis of the Scandinavian Knut Wicksell and other economists and to the important treatise by Richard A. Musgrave, *The Theory of Public Finance* (Samuelson 1980, 151).

Excludability and club goods.

The polar classification suggested by Samuelson was heavily criticized in further studies. Buchanan (1968) questioned the purity of public goods as set out by Samuelson in 1954 and suggested that many goods could not be so neatly classified. Some public goods may have "excludable" benefits. Buchanan suggested that "clubs" may exist which exclude members of the public through a mechanism such as a toll or charge. The origins of his theory can be traced to the works of A.C. Pigou (1920) and Frank Knight (1924) on tolls for congested roads. Another father of club theory is Charles Tiebout (1956) with his "voting-with-the-feet" model, which explains the relationship between the jurisdictional size of local governments and voluntary mobility or membership decisions, which is one of the main characteristics of a club good. Richard Musgrave also mentioned the "exclusion principle" when he referred to the ability of sellers to exclude potential buyers from goods and services unless they pay a stipulated price (Musgrave 1959).

Buchanan developed the theory of club goods for the first time in a 1965 paper.³ As Buchanan argues, "the theory of clubs" or "consumption ownership-membership arrangements," a theory of cooperative membership, was missing in current studies about different types of goods:

³ Olson in *The Logic of Collective Action* developed the club good theory at the same time. However, his analysis never generated the same interest as that of Buchanan.

Everyday experience reveals that there exists some most preferred or “optimal” membership for almost any activity in which we engage, and that this membership varies in some relation to economic factors. European hotels have more communally shared bathrooms than their American counterparts. Middle and low income communities organize swimming-bathing facilities; high income communities are observed to enjoy privately owned swimming pools (Buchanan 1965, 1).

As he argues, while many goods can be classified easily as private goods, few, if any, goods can be exclusively public. His suggestion is to reject the polar differentiation of goods suggested by Samuelson based on divisibility and “incorporate in the utility function goods falling between these two extremes”:

The interesting cases are those goods and services, the consumption of which involves some “publicness”, where the optimal sharing group is more than one person or family but smaller than an infinitely large number. The range of “publicness” is finite. The central question in a theory of clubs is that of determining the membership margin, so to speak, the size of the most desirable costs and consumption sharing arrangement” (NOTE: Note that an economic theory of clubs can strictly apply only to the extent that the motivation for joining in sharing arrangements is itself economic; that is, only if choices are made on the basis of costs and benefits of particular goods and services as these are confronted by the individual. In so far as individuals join clubs for camaraderie, as such, the theory does not apply) (Buchanan 1965, 1).

For Buchanan, the main rule for classifying goods is the size of the sharing group. “For any good or service regardless of its ultimate place along the conceptual public-private spectrum, the utility that an individual receives from its consumption depends upon *the number of other persons with whom he must share its benefits*” (Buchanan 1965, 3). Private good supposes consumption by one person or family; club good assumes consumption by a small group, and public implies consumption by an infinitely large group.

Excludability and common goods.

Common goods present a specific type of competitive non-excludable goods. The main difference between common goods and other types of goods is that unlike club or public goods, they are finite and thus are subject to competition among users but unlike private goods, they cannot be easily excluded from consumption because of their size and thus cannot be subject to a pure market law:

The commons can be distinguished from both public goods and private goods, though it shares some attributes of each. Pure public goods can be used by any number of consumers because, like the light from a street lamp, such goods are consumed collectively. Although the street itself can become crowded, the rate of consumption of the lamplight is independent of the number of consumers and of the particular use individuals make of the good... By contrast, private goods are individually consumed; what one individual consumes is either used up or become (at least temporarily) unavailable to others. Like pure public goods, the commons is shared, and unlike private goods, it either cannot be or is not (for any of a number of reasons) divided among separate consumers. Yet like the use of private goods, the use of the commons is characterized by individual consumers who appropriate a portion of the flow of benefits (farmer pump water, cows eat grass) and make that portion unavailable to others (Oakerson 1992, 41-42).

There are different strategies to solve the puzzle of excludability and overuse for such a type of goods, e.g. through centralized coercion (in this case, they are governed as public goods), creation of private property (governed as private goods) and a combination of both methods (governed as common property; in neo-institutional economics, a “common property regime” or CPR) (Hardin 1968, Coase 1974, Ostrom 1990). In some sense (especially for an outsider), common good has the appearance of the private good. Theoretically, any common good can be divided physically and socially into smaller parts, and then property regime (either individual or common) will allow these small parts of “commons” to function as any regular private good. i.e., the good will be under unitary management and property regime and will be excluded from consumption by unauthorized users. However, for the community involved, such a good is a kind of public good (for any insider has relatively free but socially monitored access to the resource system).

Historically, considerations about “commons” were developed first in biological and demographic research and mainly through discussion of the *tragedy of the commons*, which is a concept that describes a conflict for resources between individual interests and the common good, or collective action problems leading to the overuse of the core resource (Hess 2000). This notion first was introduced in 1833 by William Forster Lloyd, who discussed the problem of human population growth and sketched a theory of the commons. The parable he employed demonstrates how free access and unrestricted consumption of a valued thing will ultimately destroy this thing because of overuse. In a rational choice paradigm, such an outcome is explained by individual desire to maximize the benefits of consumption; as a rational agent, each individual is motivated to maximize his own use of the thing, while the costs of usage are distributed between all those who have an access to the resource. In public choice language, it is

also called a negative externality. After Lloyd, many ecologists and biologists have demonstrated that “man’s use of resources for his own (economic) purposes” is the main problem around commons (Gordon 1954, 124, on e.g. Taylor 1951).

In economic literature, the issue of commons was raised only in the mid-1950s. Two economists, H. Scott Gordon in 1954 and Anthony Scott in 1955, suggested an economic analysis of the consumption of fisheries, the classical example of “commons”:

Fishery resources are unusual in the fact of their common-property nature, but they are not unique, and similar problems are encountered in other cases of common-property resource industries, such as petroleum production, hunting and trapping, etc. (Gordon 1954, 124).

As they demonstrate, if individuals harvest high-demand fish without any regulations on the limits of consumption, it leads to the decay of fish stock and of possible economic benefits:

...everybody’s property is nobody’s property. Wealth that is free for all is valued by none because he who is foolhardy enough to wait for its proper time of use will only find that it has been taken by another... A factor of production that is valued at nothing in the business calculations of its users will yield nothing in income. Common-property natural resources are free goods for individuals and scarce goods for society (Gordon 1954, 135).

It is a commonplace to observe that for natural resources – as for other types of wealth – “everybody’s’ property is nobody’s property”. No one will take the trouble to husband and maintain a resource unless he has a reasonable certainty of receiving some portion of the product of his management (Scott 1955, 116).

...the tendency will be for exploitation to continue beyond the point where the marginal product of fishing effort equals to its marginal cost, to the point where the average product of effort just covers the marginal cost of effort... (Scott 1955, 117).

For them, the only solution was the imposition of ownership of the fishery by a single firm or by the government:

This is why fisherman are not wealthy, despite the fact that the fishery resources of the sea are the richest and most indestructible available to man. By and large, the only fisherman who becomes rich is one who makes a lucky catch or one who participates in a fishery that is put under a form of social control that turns the open resource into property rights (Gordon 1954, 132).

...the social optimum in both the long run and the short run would be demand that common-property resources be allocated to maximizing owners, associations, co-operatives or governments (Scott 1955, 124).

In 1967, Vincent Ostrom suggests his version of the commons problem using the case of oil extraction:

The simple case of a common-pool, flow-resource problem can be illustrated by reference to the development of an oil pool overlaid with a property ownership pattern where numerous individual owners have an equal and independent right to tap the oil beneath their land. The decision rules of private property law require an owner's willing consent to undertake joint action involving the use or control of his property. Without political interference, each is free to exploit the oil underlying his land for his own benefit. The most aggressive proprietor can attempt to capture the lion's share by a strategy of trying to pump as much as possible from under his land. Each other proprietor has an incentive to follow a similar strategy and maximize his individual return. Each will be led by the structure of the common-pool situation to make excessive expenditures, to overproduce in the short-run and to waste the physical resource potential in the long run... The discrepancy between potential individual gain and the aggregate net benefit to the total community of overlying proprietors is apt to lead toward a "dog-in-the-manger" attitude where each proprietor pursues his advantage and attempts to ignore the consequences of his action upon the aggregate welfare of the other proprietors (Ostrom 1967, 8-9).

In a 1968 paper "The tragedy of Commons," the concept was extended by ecologist Garret Hardin who (despite the fact that he was not the first to raise the issue) is conventionally considered as the father of the concept of commons in neoclassical economics. Like William Lloyd, Hardin was primarily interested in population and especially, the problem of human population growth rather than in the economic analysis of commons. However, he also focused more generally on the use of other limited resources such as the air and oceans, as well as pointing out the "negative commons" of pollution. Hardin begins his essay by discussing the difference between problems that can and cannot be solved by technical means. While the first category requires "a change only in the techniques of the natural sciences," the second one demands changes "in human values or ideas of morality". This category includes problems as raised by human population growth and the limits placed on the availability of the natural resources. To maximize population, one needs to minimize resources spent on anything other than a simple survival. However, that automatically leads to a worse quality of life on the planet. As Hardin concludes, there is no foreseeable technical solution to increasing both human populations and their standard of living on a finite planet:

It is fair to say that most people who anguish over the population problem are trying to find a way to avoid the evils of overpopulation without relinquishing any of the privileges they now enjoy. They think that farming the seas or developing new strains of wheat will solve the problem – technologically. I try to show here

that the solution they seek cannot be found. The population problem cannot be solved in a technical way... (Hardin 1968, 1243).

Then, Hardin suggests the classical illustration of such a problem using an example of consumption of communally owned land for grazing. As Hardin sees it, the utility to each individual of adding a single animal to his own herd is, more or less, the value of that animal; the cost to the individual is the consumption of the resources of that animal divided by the number of communal owners of the common. In other words, there are two sides to the utility of each additional animal: positive (the herder receives all the benefits from each additional animal) and negative (the pasture is slightly degraded by each additional animal). While positive benefits are owned only by the individual herder, the negative problem is shared between all members of the community using the pasture. That is, the benefit to an individual of hogging a resource inevitably outweighs the cost where communal resources are concerned. All economically rational herdsmen in the community will add as many animals as they can to their own herds and as quickly as they can (before other herdsmen do), meaning that the finite resources of the communal land will quickly become exhausted:

Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another... But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all (Hardin 1968, 1244).

As Hardin believes, this conclusion challenged Adam Smith's famous statement that individuals intending only their own gain act, as if led by an invisible hand, in a way that tends to promote the public interest. The commons situation demonstrates that an individual's own interests need not always provide the expected optimal solution, and the action of self-interested individuals will not always promote the public good.

Hardin suggests two solutions to the tragedy, centralized coercion, "mutual coercion, mutually agreed upon" (that results in "relinquishing the freedom to breed"), and clear defined property rights (which was later on interpreted by many scholars as a claim for privatization). He also speculates about the limits placed on freedom in a modern society. He suggests that freedom, if interpreted narrowly as simply the freedom to do as one pleases, completes the tragedy of the commons:

But what men does “freedom” mean? When men mutually agreed to pass laws against robbing, mankind became more free, not less so. Individuals locked into the logic of the commons are free only to bring on universal ruin; once they see the necessity of mutual coercion, they become free to pursue other goals. I believe it was Hegel who said, “Freedom is the recognition of necessity” (Hardin 1968, 1248).

This belief in the profit-maximizing behavior of actors around commons developed by Gordon, Scott, and Hardin’s analyses, was widespread in many economic and law studies until the mid-1980s (see review in Hess 2000 and Ostrom 1990). Usually, the problem with commons was articulated in game theory terms and presented as a one-round Prisoner’s Dilemma game that predicts cheating and over-utilization as the best methods for users of commons. Predictions of tragedy were confirmed by many empirical studies that explored the massive deforestation in tropical countries and the decay of fisheries around the world. The usual solutions include privatization (Posner 1977) and government ownership (Ophuls 1973).

Later on, the concept of the tragedy, the existence of open-access resources as described by Hardin and the suggested solutions were questioned by many anthropologists, historians, and neo-institutional scholars (see review in Hess 2000 and Hess and Ostrom 2003, 117-118). Many scholars argue that small-sized groups can manage common-property systems more or less successfully without the state or market intervention (Bromley 1992). Elinor Ostrom, for instance, observed a number of CPR around the world and noticed that their type of governance is quite different from the one-access regimes suggested by Hardin. They are neither private property, or nor do they fall under a centralized coercion system and are based rather on self-management by a local community:

What one can observe in the world... is that neither the state nor the market is uniformly successful in enabling individuals to sustain long-term, productive use of natural resource systems. Further, communities of individuals have relied on institutions resembling neither the state nor the market to govern some resource systems with reasonable degrees of success over long periods of time (Ostrom 1990, 1).

Her analysis demonstrates the invalidity of the negative predictions as to commons fate, which is that common property would eventually face destruction in the long run because of overuse. As she finds out, a CPR protects the core resource and allocates the parts of commons-in-use with the help of hierarchal norms that determine the amount, timing, and technology used. Such regimes are also very effective in setting the limits; they manage to create such restrictions that are not too lax (which would lead to overuse and eventually to the destruction of valued

resource) and not too strict (which would unnecessarily reduce the potential benefits of use). Based on the results of her study, Ostrom suggests eight principles, which are required to create a stable CPR:

- 1) Clearly defined boundaries,
- 2) Coordination between appropriation and provision rules and local conditions,
- 3) Collective-choice arrangements that allow all participants to take part in the decision making process,
- 4) Effective monitoring by monitors,
- 5) A system of sanctions for users who break rules,
- 6) Conflict-resolution mechanisms which are cheap and easy to access,
- 7) At least minimal recognition of the rights to organize (e.g., by the government),
- 8) Restriction of the size of CPRs (in case of larger CPRs, they should be organized in the form of multiple layers of nested enterprises, with small, local CPRs at their bases).

Nowadays, there is no consensus about the best way to govern commons. Individual property regime is criticized for being less efficient and less just than CPRs (Ostrom et al. 2002). Government regulations were used successfully in some cases (such as, tradable environmental allowances in the USA), but the efficiency of this methods is questioned for its high costs and inflexibility. While CPRs are very efficient when functioning at a local level, they fail to solve problems of overuse on a larger scale, like with air pollution.

It is perhaps far from incidental that the commons studies are the only ones that refer to Roman categories of property.⁴ For instance, Bromley (1992, 4), Runge (1992, 18), and Hess and Ostrom (2003, 121) indicate that *res nullius*, or “no one’s property” can be easily identified as one type of common good: open access resources or unregulated commons as described by Hardin (1968). As they (and many other scholars of commons) argue, Hardin’s model applies only for open access resources, “wherein an inability to exclude outsiders from their utilization sets the conditions for unregulated freeloading. Without the possibility to develop communication, reciprocity, and mutual trust as institutionalized patterns among co-sharers,

⁴ Neoclassical economists do not care to compare their division of goods into four distinct categories with the Roman classification of things into *res omnium communes*, *res publicae*, *res universitatis* and *res nullius* in Justinian's *Institutiones* (II: 1). Only lawyers do – see e.g. Rose 2003. Moreover, the term *res publica* itself was discovered in only one textbook on public policy analysis. Parsons briefly mentioned this term in the section “Public and private as concepts” and stated that “it is from the Romans that we derive our concept of public and private: they defined the two realms in terms of *res publica* and *res priva*” (Parsons 1995, 3).

extractors pursue simple strategies of self-interest” (Rosin 1998). After Hardin, scholars demonstrated that there is also a range of possible property regime on common resources where consumption can be effectively managed, which is defined as common pool regimes: “Among these kinds of property regimes are governmental or state control, private or corporate ownership” (Rosin 1998). However, neither Runge nor Hess and Ostrom suggest Roman equivalent for such type of a common good.

Table 3. Types of common goods.

	GOVERNANCE	
	None	Joint property regime
Classical, pre-Hardin studies	Common good	No studies before; the topic about property regime arises only in 1970s among institutional scholars
Neoclassical economics	Open access resources (Hardin) Nobody regulates them – thus, “the tragedy of commons”	Common pool regimes (Ostrom) A regime that effectively regulates joint use and management of a resource
Roman law	<i>Res nullius</i>	No insights in economic literature; possible equivalent was suggested by Rose (2003) who employs the category of <i>res universitatis</i>

What is the difference between a common good and CPR? By their nature, the terms mean the same for they refer to material entities that belong to everybody. However, commons is a wider notion and includes considerations about democratic spirit in common things. Common pool resource is a more specific category that describes a type of competitive non-excludable economic good:

Common good: The commons appears to be an idea about democratic processes, freedom of speech, and the free exchange of information. The term "commons," however, has various histories, from property to shared spaces to notions of democratic ideals. It refers to the house of British Parliament representing nontitled citizens, and agricultural fields in England and Europe prior to their enclosure. In the United States, commons refers to public spaces such as the New England town square, campus dining halls, and concepts of the "common" good. In almost all uses, the term has been contested. In the realm of legal property

rights, the publication of *Ancient Law* by Henry Sumner Maine in 1861 set off a major debate about the origin of the very concept of property in ancient times. Drawing on his own extensive research in India and the research of others on early European communities, Maine argued that joint ownership by families and groups of kin (in other words, common property) was more likely the initial property regime in most parts of the world than the notion of property owned by a single individual. This great debate was not simply one between historians over whether common property or individual private property came first. Rather, the debate framed a perspective on whether landed proprietors have a special role in society that needed protection and the legitimacy of enclosing properties owned communally. The debate started long ago and is still not fully resolved. A major textbook on property law devotes the entire first chapter to *The Debate over Private Property* and the second chapter to *The Problem of the Commons* (Hess and Ostrom 2003: 115).

CPR: Common-pool resources share with what economists call "public goods" the difficulty of developing physical or institutional means of excluding beneficiaries. Unless means are devised to keep non-authorized users from benefiting, a strong temptation to free ride on the efforts of others will lead to a suboptimal investment in improving the resource, monitoring use, and sanctioning rule-breaking behavior. Second, the products or resource units from common-pool resources share with what economists call "private goods" the attribute that one person's consumption subtracts from the quantity available to others. Thus, common-pool resources are subject to the problems of congestion, overuse, pollution, and potential destruction unless harvesting or use limits are devised and enforced. In addition to sharing these two attributes, particular common-pool resources differ in many other attributes that affect their economic usefulness including their extent, shape, and productivity, as well as the value, timing, and regularity of the resource units produced (Hess and Ostrom 2003: 120).

Additional types of goods and their specific properties

In economics, we can also find additional types of goods that do not fit in the conventional division easily. Collective good, or social good, is one such type of ill-fitting good. Such a good can be delivered as a private good but instead is delivered by the government for various reasons (like social or military security), financed from public funds, and thus, presented in society as a public good. Musgrave suggested concepts of "communal wants" and "merit goods" to explain the existence of such goods (Musgrave, 1959, 1980, 1987). As he argues, conventional distinction between private and social goods is based on certain assumptions about individual preferences. Goods are different in their physical nature (that is, they can be rival or excludable), but they are not different in psychological attitudes, or in "social philosophy regarding the two types of goods." "Social as well as private goods are experienced by

individuals and included in their preference systems. The same individualistic psychology was applied to both types of goods” (Musgrave 1980, 83). As a result, a model based on the needs and preferences of individuals is widely used to analyze the provision of both private and public goods. “The concept of communal needs, on the other hand, is hard to interpret and does not fit such analysis. Moreover, it carries the frightening implications of dictatorial abuse. Yet, the concept of community also has its traditions in Western culture, from the Greeks through the Middle Ages and to date, and should be given at least brief consideration” (Musgrave 1980, 84).

Musgrave states that there exists a community interest as such, “an interest which is attributable to the community as a whole and which does not involve a “mere” addition, vertical or horizontal, of individual interests. These community interests then give rise to communal wants, wants which are generated by and pertain to the welfare of the group as a whole” (Musgrave 1980, 84). Examples of such interests include “concern for maintenance of historical sites, respect for national holidays, regard for environment or for learning and the arts” (Musgrave, 1987, 452). Then, such definition raises two questions: 1) to whom and how such interest is revealed, and 2) the application of the communal concept. Suggesting an answer only to the first question, Musgrave assumes that:

By virtue of sustained associations and mutual sympathy, people come to develop common concerns. A group of people, for instance, shares and historical experience or cultural tradition with which they identify, thereby establishing a common bond. An individual will not only defend *his* home but join others in defending *our* territory or in protecting *our* countryside. Such common interests and values may give rise to common wants, i.e. wants which individuals feel obliged to support as members of the community. These obligations may be recognized as falling outside the freedom of choice, which applies in deciding whether to drink tea or coffee (Musgrave 1980, 84).

While it is a very interesting suggestion, there are some problems. First, the concept is too vague. Second, Musgrave did not explain how economists could apply this concept to the analysis of the budget process. Third, he rejected the practical usage of this concept in the last paragraph of the section discussing communal wants. He states that a realization

...that common concerns or values exist does not lead one to conclude that all resource allocation, or even the larger part thereof, should be based on considerations of community interest, rather than on individual preferences. No apology is needed, therefore, for having based our analysis of public provision on the individualistic premise (Musgrave 1980, 84).

The concept of a special “merit good” then followed from considerations about communal wants that give rise to such goods:

[There are] many instances where policy seems to aim at interfering with rather than responding to individual preferences. Some goods are considered “meritorious” while others held undesirable. For instance, low-cost housing is subsidized because decent housing is held to be desirable, while sumptuary taxes are imposed on liquor because drinking is held undesirable... The distinction between goods, which are given a social stamp (favorable or unfavorable), and those which are considered neutral must not be confused with that between private and social goods. The merit-goods issue cuts across the latter distinction (Musgrave 1980, 85).

Musgrave argues that merit goods are different from public goods and suggests the following definitions:

Such wants are met by services subject to the exclusion principle and are satisfied by the market within the limits of effective demand. They become public wants if considered so meritorious that their satisfaction is provided for through the public budget, over and above what is provided for by private buyers (Musgrave 1959, 13).

The existence of merit goods thus defined may be taken to suggest that our society, which considers itself democratic, retains elements of autocracy which permit the elite (however defined) to impose their preferences. Or, it may be interpreted as adherence to community interests or values by which individual preferences are overridden. Either explanation contravenes free consumer choice, the otherwise accepted principle of resources use (Musgrave 1980, 85).

Like in the case of communal wants, merit goods are an unconventional concept for economic analysis. As Musgrave argues, it cannot be easily integrated in the existing analysis. “In part this reflects elitist domination, but in part it also reflects the prevalence of communal interests. The fact that such interest are inconvenient to conventional analysis (What does not fit cannot be!) does not disprove their existence” (Musgrave 1980, 86). However, this is the last argument suggested by Musgrave, who does not suggest any further considerations of what we are supposed to do with merit goods and communal goods now. As a result, these are not widely discussed concepts in economic and public choice literature; their existence is just skipped in many studies. A few studies still discuss and suggest different interpretations of merit goods; however, most of them apply this concept specifically to the field of fiscal theory (Colm 1965, Head 1966).

One final thing to note is that some authors support a distinction between global public goods (a public good that is non-rival and non-excludable throughout the whole world, such as,

knowledge and Internet) and national public goods (a good that exists in one country, such as national defense).

Cold water and centralized heating supply: example of what?

How can we connect all these considerations about a typology of goods to the case studies presented in Part II of the book? Water and heating supply systems are an essential part of urban (and in some places) rural life and at first glance can be considered as commons for most cities around the world. As Hess (2000) indicates, urban commons are one of the areas with the fastest growing literature – thousands of studies about cities were produced during last twenty years. However, even a brief literature review quickly indicates that water and heating systems in particular have not been widely discussed, as the notion of urban commons includes “apartment communities and residential community associations, streets, parking spaces, playgrounds, reclaimed buildings” (Hess 2000), but not underground infrastructure, like water and heating pipes. In the Digital Library of Commons (<http://dlc.dlib.indiana.edu/>), one of the best online bibliographies on common pool resources, the group of urban commons additionally includes neighborhoods, parks, roads, sidewalks and urban forestry, and groups of urban infrastructure: roads, transportation, and sidewalks. There is no such issue as “heat” in this collection and while water is classified as a “common-pool resource,” it applies mainly to descriptions of farm irrigation systems and ocean/coastline/marine control rather than to the topic of our interest, centralized urban water supply (e.g. Herbich et al. 2004, Ostrom 1992, Sampath and Young 1990).

Literature on urban water supply

There are thousands of studies about water supply systems both at urban and rural levels around the world but they do not refer to water as a specific category of conventional taxonomy of goods. Of course, we could speculate about their possible intention to place the water into a public or common good category. For example, in Ladki et al. 2004 there is a clear tendency to discuss the water as commons; this study is also classified as “research on commons” in the Digital Library of Commons. However, in most cases the authors do not provide direct evidence about such choices and do not claim to study common or public good.

By contrast, in the literature on the commons, there are different definitions for water.⁵ Historically, water (as a whole world water reservoir) was initially treated as a public good, because it was non-excludable and available for everybody without competition:

Traditionally, water has been treated as a free gift of nature and, therefore, not subject to being traded, capitalized or priced in any way whatsoever. Since water can flow, seep, freeze or get vaporized, and escape from one person (or area) to another with ease and speed (unlike land), its ownership has always been a problem for economists as well as lawmakers (Paranjpye et al. 2002, 24).

Then, in the face of population and pollution growth and a clean water scarcity problem, it came to be considered as a common good. It is hard to exclude others, but people compete for water. Thus, a text on implications of widespread irrigation says: “A central problem of irrigation performance is the ability of some farmers to steal water from other farmers. This fact has been extensively documented in numerous studies of irrigation performance. The most common manifestation of it is that farmers at the heads of irrigation systems usually receive far more water than they have a right to, while farmers at the tails receive less. If property rights in water formally recognize rights to diversions while denying historical rights to return flows... they institutionalize theft... As development proceeds upstream, downstream users receive progressively less and more polluted water” (Perry et al. 1997, 12). Other studies stress the scarcity of water as a result of growing or even massive consumption:

Intuitively, everyone believes that water belongs to all, but in practice, (almost) everybody tries to control or own it. An acceptable position seems to be that a ‘water-charge’, for whatever purpose it is meant to be, is not the full cost of ‘producing’ water, but the cost of making available purification, transmission, distribution, treatment, disposal etc. Therefore, a charge is not the ‘price’ of water but a service-charge. On the other hand, financial agencies would like to look at the macro-economic or systemic availability, which is finite. They would then talk about a “scarcity” price (which can often degenerate into an exorbitant monopoly-price when deep tube-well owners start selling it in cities and towns during time of severe drought). The problem gets more complicated when large corporate enterprises start appropriating huge quantities because they can afford to buy it or bid for it. At such times, people downstream have to contend with contaminated and harmful water. Thus, market failures are common phenomena in the case of water (Paranjpye et al. 2002, 24).

Nowadays, with the help of metering technologies, it is suggested that water could be considered even as a private good:

⁵ Again, the existing studies are more about watershed and groundwater resources rather than about urban water supply.

The divergence between water supply, which is finite, and demand which, is by definition infinite, is a typical economic problem. Economists and planners opt for “water-markets” to resolve the issue and then arrive at a series of equilibrium (partial) prices at different locations (Paranjpye et al. 2002, 24).

Summing up, one can say that there is a divergence in academic opinions. Some scholars argue that water is a public and common good, while others insist that it is a private good, subject to allocation through competitive market pricing. As usually, criteria to define water as a particular type of good are vague, and the final placement in a given category of goods depends frequently on the position of the analyst:

The question is not whether water is an economic good or not – it certainly is an economic good in most cases, like almost everything we have to worry about. Rather the question is whether it is a purely *private* good that can reasonably be left to free market forces, or a *public* good that requires some amount of extra-market management to effectively and efficiently serve social objectives. The answer to this question likes not so much in lofty principles but in value judgments, and their application to different conditions of time and place. Thus, we find ourselves favoring the private good side of the argument in some cases and the public good in other (Perry et al. 1997, 1).

Arguments in defense of the private nature of water are as follows: in a modern society, water is a scarce resource, and thus, it should be treated like any other private good. “Water has an economic value in all its competing uses, and should be recognized as an economic good” (ICWE 1992). Its production and distribution should be determined by the overriding value of the consumer’s utility by the amount that a particular consumer is ready, willing, and able to pay for it. If a consumer does not have enough money to pay, then he or she should get less water:

The idea of “water as an economic good” is simple. Like any other good, water has a value to users, who are willing to pay for it. Like any other good, consumers will use water as long as the benefits from the use of an additional cubic meter exceed the costs so incurred (Briscoe 1996).

That position quickly becomes popular among the world’s financial institutions:

The World Bank, for example, promoted (a) “full-cost pricing of water for different uses; (b) “privatization” of water services to achieve water-use efficiency and financial accountability; (c) and introducing and advocating the concept of “water–markets (Paranjpye et al. 2002, 9).

However, such policy has been heavily criticized by scholars, who treat water as a common or public good. As they argue, water is a basic human need that should be excluded

from the destructive exchange and trade at a market. Even given the scarcity problem, water should be available at reasonable levels to everyone independent of her capacity to pay. The marginal utility of water is infinite (and incalculable) in some cases, for example, in a drought, when people are dying of thirst. In a free market, in such cases a consumer has only one option - get water or die, and that is an unacceptable choice for modern humane societies:

Civilized societies provide basic rights protecting citizens against murder, imprisonment without trial, torture, and even indentured servitude. And, for the same reason, humane societies attempt to assure their citizens with a minimum supply of basic needs – starting with water, food, shelter, and medical care (Perry et al. 1997, 5).

Still, as the same studies indicate, the logic of water publicity should stop once a certain quantity of supply was reached. When the margin of basic needs has been satisfied, water should be supplied through free market. In other words, the same good, water, can be treated differently at different levels of consumption:

Supply of water at a level of basic needs is an obligation of humane societies to provide irrespective of the ability to pay. At a higher level of supply, lower on the marginal utility curve, society has little or no interest at all and consumer's sovereignty should rule (Perry et al. 1997, 6).

Some scholars also argue that water also fulfills the criteria for being considered a merit good, that is, a good that sometimes and in certain places for some reasons is considered as desirable to consume for a society and is provided as a public good:

Cultures vary according to the various dimensions they perceive as significant: safety, efficiency, beauty, sanitation or health, heat, purity, sanctity, merit, honor, the drama of morality or self-aggrandizement (Rosin 1998).

Here, water is treated as a good whose availability to certain groups and for certain purposes at a low price will serve the greater benefit of society as a whole: “Access to clean water for washing and personal hygiene has health benefits (reduced incapacity for work and medical costs) that generally exceed the cost of providing the water” (Perry et al, 1997, 6).

Water is also treated as a common pool resource (e.g. Akinola 2004, the case of water supply in villages in Nigeria; Kollegal 2000, water supply systems in villages in India; Ostrom 1967, groundwater around the world; Paranjpye et al. 2002, general definitions of water as a good and a need, and Theesfeld 2005, the case of irrigation system in Bulgaria):

Whenever water behaves as a liquid, it has the characteristics of 1) a common pool, flow resource involving; 2) a complex bundle of potential goods and bads,

which sustain; 3) a high level of interaction or interdependency among the various joint and alternative uses (Ostrom 1967, 8).

Kollegal (2000), for instance, analyzes changes in water supply systems in villages around India. As he argues, initially, community wells and ponds were the main source of drinking water there, and a local community successfully managed their maintenance. The installation of new technologies, such as hand-pumps, deep tube wells, and pipeline systems results in the breakdown of old control mechanisms: "... neither the users nor the donors or the state has viewed the 'installed equipment' clearly as common property resource.' The system of rules & regulations governing local 'Operation and Maintenance', constituting the 'common property regime', rarely tries to draw upon the design of prevalent local CPR institutions for managing the 'old commons' like village wells, ponds and lakes" (Kollegal 2000). The result is well predicted by the tragedy of commons: new equipment is functioning at sub-optimal levels, hand-pumps are rusty and broken, and reservoirs are leaking. As Kollegal demonstrates, the CPR perspective on water as a common good is a useful approach to explain what happened in villages around India:

... the drinking water infrastructure in the villages is 'new commons' with an 'alien technology', the workings of which are not fully understood locally. Whereas, the 'old commons' of natural or even man-made water bodies are clearly understood, the 'old commons' often have local sources unlike many 'new commons' such as the pipeline drawing water from a distant reservoir, and are popularly perceived as belonging to the village. The users see the new infrastructure as belonging to the government and assume no responsibility to maintain it. All this makes it difficult for a sense of common ownership to emerge. Under these conditions, the system becomes a state-owned open access resource rather than a CPR, leading to its degradation (Kollegal 2000).

Literature on centralized heating

In general, there is little in the social science literature on centralized heating beyond the comments of practitioners on the interdependence of technical configuration and economics and some historical studies of the development of the technology (see review in Summerton 1992). This is despite the fact that such systems are widely used in Scandinavia (except Norway), Germany, Austria, East European, and the former Soviet Union countries.⁶

⁶ Other countries such as the US, Great Britain, Switzerland, Italy, and Belgium also have some heating systems. In the US, district heating is employed in New York, St. Paul (Minnesota), Trenton (New Jersey), Pittsburgh (Pennsylvania) and Los Angeles (California). However, the use of district heating had declined in the US during the

A search for categories “heat” and “heating” in the Digital Library results in a number of studies that are concerned mainly with sources of heat (fuelwood) and the surrounding tragedy of commons in the case of forests rather than with considerations about heat from centralized technological systems. In these studies, forests are considered as the main sources of fuel for cooking and heating. The main issue is the over-consumption of forests without centralized regulations (An et al. 2002, Arnold 1979, Bhatt and Sachan 2004, Pattanayak 2004). During the 1990s, there have been a number of reports about the economics of centralized heat systems in the former Soviet republics produced by the Russian Ministry of Energy and the World Bank (Freinkman 1998, Lampietti and Meyer 2003, Minenergo 2002, Natsionalnyi Doklad 2002, World Bank 2003). However, they suggest no insights about the placement of heat in any category of conventional taxonomy.

In fact, the only social science study about centralized heat systems I was able to locate was Jane Summerton’s dissertation on the district heating system in Sweden. Unfortunately, she did not employ the typology of goods from public policy analysis or neoclassical economics and thus did not put heat into any of the conventional categories. Still, she suggests some ideas that can be interesting for our project. Following Latour’s early studies, she treats a district heating system itself as a black box:

District heating is an example of a socio-technical system. Socio-technical systems are crucial parts of everyday life in most industrialized countries. Some of these systems – such as electricity, natural gas, water supply and telephone – are well known to most of us. District heating is not. In many countries, it is virtually unknown, while in others it is a taken-for-granted technology that has been around for a long time. Even in those countries in which it is a “known” technology, its modes of operation and internal dynamics are often only vaguely understood by its users. Like many other socio-technical systems, district heating thus remained a typical example of a “black box”. Consumers or social scientists may know a little about what goes in and what comes out, but the dynamics and processes within the “box” are unexplored and unknown, despite the societal importance of the system (Summerton 1992, 14).

period of 1970-1980s (Summerton 1992). While the experience of these places can be used to explain the case of heating systems in Russia, there is still one major difference that should be kept in mind: in most places around the world, district heating emerged after most commercial and residential buildings had been built, i.e. district heat came to a town, where an infrastructure already existed. Thus, construction of the centralized distribution network required negotiations between numerous actors. In the former Soviet Union, the heat network and most buildings (and in many places, the city itself) were constructed simultaneously, and many principles that governed heating projects in other countries were not relevant here. Even in Moscow and St. Petersburg (the cities with already existing material infrastructure), most residential buildings were constructed during 1946-1975, the period when centralized heating systems had been constructed widely around the country.

The blackbox quality comes from the fact that heating in a Swedish town is provided by a largely invisible infrastructure that supports urban life:

A district heating system is just one of many socio-technical systems that are “invisible” in a sense that we seldom reflect over them. We simply pay the bill and that is it. We get upset when the systems fail. Numerous other socio-technical systems remain invisible in other ways as well. Although certain artifacts such as generating plants are highly visible, crucial parts of the physical infrastructure that supports a system are hidden from view. We turn up the heat, flip on the light switch, or turn on the water, but we never see the scientific labs, the fuel tanks, the pipelines or the cables that bring the commodity to our homes (Summerton 1992, 14).

Using the insights from studies on water, we can speculate about the placement of centralized heat in our typology. I will use examples from both academic literature and newspapers to illustrate my points. Unlike water, heat in Russia is never considered as a private good that should be sold at a free market. There are many proposals to introduce some market principles in the heating sector (like competition among utility providers, 100% payment for services, etc. – see Freinkman 1998, World Bank 2003). However, heat itself is not treated as an economic good. The argument against marketization and privatization is based on considerations about the social vitality of heat in the cold climate. In a neoclassical language, that means that heat can be interpreted as a merit good:

Public health and hygiene, as well as the long-term survival of the buildings themselves, dictate that structures be heated. The importance of a health and productive population to economic survival dictates that the occupants have reasonable standards of heat, light, hot water and appliances (Kazakevicius et al. 1998, 832).

Warmth – it is as essential as food and shelter for survival in many developing countries... Inadequate warmth increases the likelihood of cardiovascular and respiratory disease, directly contributing to excess winter mortality. Yet you cannot buy warmth, you can only buy the fuel, appliance, and housing necessary to create and contain it (Wu et al. 2004, 345).

A person cannot live without water, food, or heat. All other needs can be considered a product of modern civilization. However, heat is a unique product that cannot be purchased abroad and brought into frozen towns. The crisis in the heat supply system was caused by the actions of the country’s former leadership. However, the further deterioration of the system will be associated only with the inactivity new leaders. Freezing citizens can only be easily organized for a new revolution. Therefore, the interests of the state and citizens (who are, by the way, the state itself) are similar, but in “warm” Moscow not everybody understands

that. The issue of high quality heating systems is the issue of the survival of the Russian nation (Natsionalnyi Doklad 2002, 6).

Heat is an extremely non-market good. The producer cannot store it for future resale, and the consumer cannot live without it (Natsionalnyi Doklad 2002, 29).

The argument for heat as a merit good is also presented by Collier (2001), though he does not refer directly to such a category. Collier describes the current development patterns in small cities around Russia and demonstrates that basic characteristics of the social and material reality have persisted here regardless of the implementation of a market-oriented program. He suggests understanding the existence of such forms in terms of the 'stuck' of social and economic relationships that were inscribed materially and institutionally in the design of small cities around the USSR. As Collier suggests, the technical details of these systems themselves are the main constraints of market reforms. In order to implement such reforms, technologies must be completely dismantled. However, this is not easy: technologies prescribe certain interdependencies at the local level among a range of human actors (like enterprises, local, regional and federal public administrations, and residents), who are stuck with the existing infrastructure in their cities. The option of destroying such structures is unrealistic, for many of them are critical for human survival in Russia. The centralized heating system is an example of such vital goods, without which nobody can survive in the country's frigid winter.

However, there is a debate about the rationality of treating heat as a merit good in Russia. Fiona Hill and Clifford Gaddy (2003) argue radically that only by refusing to consider it as a vital service (especially for residents in cold and expensive to heat Siberia), can Russia achieve sustainable economic growth. In their book, they review the history of market reforms in the country (many of which failed) and argue that Russia's geography and history and the monumental mistakes made by Soviet planners have locked it into a dead-end path to economic ruin. Russia's greatest assets, its gigantic size and Siberia's natural resources, are now the source of one of its greatest weaknesses. For 70 years, driven by ideological zeal, communist planners forced people to live in Siberia. After the Soviet Union's disintegration, tens of millions of people and thousands of large-scale industrial enterprises languished in the cold and distant places communist planners put them. Many Russian officials still consider an industrialized Siberia as the key of Russian prosperity. As a result, the country is burdened by the ever-increasing costs of subsidizing economic activity in some of the most forbidding places on the planet. As Hill and Gaddy argue, Russia pays a price for continuing to support Siberia: it wastes

the very resources it needs to recover from the communist economy. Their recommendation is very radical – Russia should throw off this legacy, shrink Siberian cities, and facilitate the relocation of population to western Russia, closer to Europe. “Downsizing Siberia will be a costly and wrenching process. However, there is no alternative. Russia cannot afford to keep the cities left by communist planners out in the cold.” (Hill and Gaddy 2003, 3).

While not directly referring to heating infrastructure, some sources indicate also that any in-house technological system can be treated as a common pool resource:

A building’s infrastructure [i.e. hallways, corridors, and other structural features shared commonly in apartment buildings] as an object of public usage is doomed to degradation (Kuznetsov 2001).

The rights and responsibilities of common ownership in residential buildings (such as the ownership of cellars and attics, staircases, waste management, heating, water and gas pipelines, the courtyard, and so on) are not clear. In addition to issues of common ownership, special rules about the common consumption of these goods should also be created. Nobody can live alone in a multi-apartment building. The inhabitants of such apartments directly affect the heating and ventilation systems in adjacent units; they also use the common staircase and the elevator. It is practically impossible to disconnect gas, water, or heat in a single unit – not because of the technical requirements or the engineering system, but mainly because of the possible risks for all other units. Modern buildings are intended to have multiple residents, and this is not an engineering [technical] problem (Agroskin 2003).

Being engaged in common consumption and common ownership, residents of the apartments in multi-unit buildings should have joint responsibility to pay for services that are collectively consumed. If electricity can be easily disconnected in a single unit, the heat disconnection will result in serious risks for other residents. The disconnection of the elevator or sewage system is simply impossible (Agroskin 2003).

Thus, depending on the position and values of an analyst, water as well as heat are treated as a merit public good, a common good, or an ordinary private good. There are no conventional definitions and categorizations of these goods in the existing literature.

Therefore, it is at a discretion of a given scholar to evaluate these systems in contemporary Russia, as he or she would see it fit. One can treat them as ordinary market goods. However, this raises a question about water and especially heat (which is vital for human survival in a cold country) as basic human needs that every civilized society is supposed to

provide for its residents. A better option could be to consider them as a merit good – a (public) good that is claimed to be desirable to consume and that is provided through the state agencies. That would imply that one should especially focus one’s analysis on evaluation of value judgments inscribed in these goods.

One could also classify heat and water as common goods and more specifically, as the new commons (Hess 2000). While Hess mentions only information-technologies, water and heat systems are also examples of human-made, technology-driven common pool resources.⁷ That means that one would have to focus especially on free-riding problems, congestion and difficulties with non-excludability.

Finally, water and heat could also be classified as club goods, because a user is supposed to pay a fee before starting consumption of the service. That would imply an analysis of limits that are created to exclude non-payers from the system. However, such a categorization raises questions about the social desirability of the water and heat in the country; if they are club goods, then society should have little or no interest at all in their provision, and that is in reality not the case. Therefore, in our book we will take two options – to consider water and heat as a public (merit) good or as a common good.

Conclusion

One new emphasis that our book could make is attracting scholarly attention towards a link between the nature of goods and institutions that shape human interactions around these goods. For example, as Hess indicated, “to many average American citizens, the commons means the ‘common good’ and is connected with ‘community spirit’ and democratic principles. These studies have seldom been incorporated into the traditional CPR literature” (Hess 2000, 8). Indeed, how the commons are linked with developing a common or public spirit, has been mostly left outside this literature.

⁷ “The IASCP eighth conference chairs described the new commons session topic as: ‘Technology development creates new common pool resources (Internet) and enables codification and management of existing common pool resources (genetic pool). How do issues of access, social exclusion, intellectual property rights, and commercialization shape the governance of these common pool resources (CPRs)? Population settlement creates common property that has to be managed by all residents (condominiums). Budgets of private and government corporations as well as international organizations (for example, EU farm subsidies) and the allocation of their shares among competing activities can also be analyzed as a common pool resource’.” (Hess 2000, footnote 1).

Some scholars suggest considering the influence of a physical nature of the common goods on the structure of institutions. While not developing this point in detail, Bickers and Williams note that sometimes the physical nature of the good can be very important for understanding how we should treat goods and how human institutions around them should be constructed. Their example is fisheries, which are conventionally recognized as a common pool resource:

Let us consider two different kinds of fisheries, salmon and lobster fisheries. What is the difference between these two? No, lobsters do not swim upstream to spawn. Indeed, lobsters are pretty immobile. In contrast, salmon swim greater distances over the course of a year, depending on the species. In essence, salmon are migratory. Nonetheless, salmon may be over-fished, because fishers can readily identify key areas in their migratory routes.

When trying to figure out how to reduce over-fishing, do the difference in the physical characteristics of lobsters and salmon matter? The institutions that are appropriate for managing these fisheries will depend greatly on these physical characteristics. For lobster fishers, self-organization may be possible. Lobster fishers will be more likely to know one another, and thus they may be able to monitor and sanction one another... As for salmon, such self-organized solutions appear much more difficult (Bickers and Williams 2001, 122-3).

This example is interesting, for such consideration is not very common in public policy literature. Conventional studies present material entities as if their nature is mostly dependent on humans, whose consumption determines the social fate of a given good. The nature of a good can be changed if humans decide to do that (e.g. clean air can be easily transferred from the public good category to club or even private good; like in the US, it can be sold through transferable emissions permits). By contrast, the note by Bickers and Williams suggests that some things do have a more independent nature, and this observation is usually missing in economic analysis. Such things can have qualities that affect humans and determine arrangements around which humans are forced to interact.

Thus, one of the principal contributions of our book could be the following. By using the taxonomy of goods as suggested by neoclassical economics, but also holding in mind the ANT considerations about an exchange of qualities between humans and non-humans in complex networks, our case studies will try to examine the link between the nature of the different types of goods and the opportunities for building democratic institutions in a transitional country. This topic was already discussed in Risto Alapuro's chapter that analyzes the role of material entities in collective action. While the effect of common goods in a wider society was studied in pre-Hardin literature (see review in Hess 2000), and the impact of technology on society has been

widely studied in the philosophy of technology (Brey 1997) and political economy of technology (Winner, 1992), there is still a missing point. I could not locate any research that treats seriously and in detail the character of things that bring the commons together. Also lacking is a description of the democracy-enhancing or limiting effects of different types of goods around which people interact.

Case studies presented in Part II of the book will try to suggest answers to some of these questions and will show how different types of goods function at the level of a city and an apartment block.

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