

# The Social Dilemmas

By Leon Felkins

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This area is **in work**. Best I can tell, it will always be that way

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*"For that which is common to the greatest number has the least care bestowed upon it. Every one thinks chiefly of his own, hardly at all of the common interest; and only when he is himself concerned as an individual. For besides other considerations, everybody is more inclined to neglect the duty which he expects another to fulfill; as in families many attendants are often less useful than a few. Each citizen will have a thousand sons who will not be his sons individually but anybody will be equally the son of anybody, and will therefore be neglected by all alike."*

-- From Aristotle's "Politics", Written c.a. 350 BC

Unless you are in certain specialties of Liberal Arts in the academic world, you probably have never heard the term, ***Social Dilemma***, a dilemma or paradox that commonly results from ***Collective Action***. Like me, you may have read a little bit about the ***Prisoner's Dilemma*** a few years ago when it received some publicity in well known publications such as [Scientific American](#). Most of you probably dismissed the ***Prisoner's Dilemma*** story as just another academic construction with little real significance. But I found the "collective action problem" -- the "social dilemmas" -- that is the fundamental characteristic of the Prisoner's Dilemmas, very intriguing. Since I like puzzles, paradoxes, and examples of the apparent diabolical nature of the universe, I became very interested in the subject and continued to give it much thought.

From the ***Prisoner's Dilemma*** "game" I drifted into the more general and much more significant study of the ***Social Dilemmas***. What I have found is that this little field of study, tucked away in several obscure corners of academia and little known by the general public, is concerned with one of most serious and baffling problems in the civilized world today! Uncontrolled government spending, the deterioration of the public schools, the near collapse of law and order, the loss of individual freedom, out

of control welfare programs, teenage sexual promiscuity, are just a few examples that result from the *Social Dilemmas*.

So, I hope you will check out what I have to say here and whether you agree or disagree, let me know.

Let us first review the simpler, but far more well known, example -- the Prisoner's Dilemma.

## Introduction

### • The Prisoner's Dilemma (PD)

The Prisoner's Dilemma is a short parable about two prisoners who are individually offered a chance to rat on each other for which the "ratter" would receive a lighter sentence and the "rattee" would receive a harsher sentence. The problem results from the fact that both can play this game and if both do, then both do worse than they would had they kept silent. This peculiar parable serves as a model of cooperation between two or more individual in ordinary life in that in many cases each individual would be personally better off not cooperating (defecting) on the other.

The Prisoner's Dilemma model's real importance is that it is simple yet fully displays the problem of a "Social Dilemma" typically arising in a "Collective Action" -- which can be defined thusly:

"The problem of collective action can then be taken in a preliminary way to be a dilemma or conflict between collectively and individually best action, where the action required for achieving the collectively best outcome or goal is different from (and in conflict with) the action required for achieving the individually best outcome. . ."  
(Quoted from "On the Structural Aspect of Collective Action and Free-Riding" by Raimo Tuomela, published in *Theory and Decision* 32: 165-202, 1992)

Understanding the PD, then, is the first step in understanding the Social Dilemmas in general.

- As many of you are familiar with the so-called "Prisoner's Dilemma Game", I will not repeat the details here. However, if you do not fully comprehend the details of the model, then you should take a moment and review it because it is important to the understanding of the rest of this essay. For a

good introduction to the Prisoner's Dilemma , see [Special Issue of The Ethical Spectacle](#). For your convenience, a [brief write-up on the Prisoner's Dilemma](#), including references, is included in this series of essays.

- Another [good essay on the PD](#) with much supporting material is available at *Principia Cybernetica* (For more good stuff there, go to the [Table of Contents](#). The *Principia Cybernetica* is a massive and ambitious site that covers such things as the Social Dilemmas, Memes, Cognitive Science, Philosophy, Psychology, Communications, Computers, etc., etc. The table of contents is overwhelming, although probably most items are empty at this time. It appears that it will take years to finish this project!)
- For an even more scholarly discussion of the PD, go to the [Stanford Encyclopedia of Philosophy](#). There you will find a discussion on related forms of this non-zero-sum game, such as "Chicken" and the "Assurance Game".
- Newsgroups and Interest Groups on the Internet.  
I'm still looking. I have checked out a couple of the Interest Groups with little success. Not much activity. As those who study *music* may actually play music at times, those who study *defection* seem to have a strong propensity to *defect*. That makes communication with such groups somewhat difficult.  
If anyone finds an interesting and/or useful group, please [send me email](#) on it.
- Other References are [here](#).

## • **Social Dilemmas (SD) or 'The Problem of Collective Action'**

While the Prisoner's Dilemma illustrates the basic paradox of cooperation -- "the individual gains more by not cooperating, but if both defect, they both lose more than they would if both cooperated" -- it is not as general and as common as the *Social Dilemmas*. The Social Dilemmas result from the situation in which a group shares a common output and in which each individual must decide to contribute or not. An example would be a community picnic with voluntary contributions. It turns out that the "rationally" best choice of the individual is to "free-ride" if she can share in the group rewards regardless of her contribution.

At this point in the explanation, most people get their hackles up and say such things as "Only a real jerk would intentionally freeload on a picnic, or such, without at least trying to contribute their share". True, but don't be too quick to dismiss the possibility that even you might free-ride! It depends on the circumstances, especially the cost. For example, most people routinely try to avoid paying any more taxes than they have to. I would say you're free-riding,

particularly if you are getting more in services from the government than you are paying. Go to ["examples"](#) for more.

In this essay, I will only be able to touch the high spots of what this problem is all about but I will provide extensive references for those of you that would like to know more. Basically the issue is about the problem of group shared property where individuals that do not contribute cannot be excluded. Such individuals are often called ["freeriders"](#) and such shared goods are referred to as "public goods". "Public Goods" was precisely defined by Russell Hardin in his book, *Collective Action* (see references), as goods having these two characteristics:

- ***Non-excludability*** - If the good is available to anyone, it is available to all. It is impossible to exclude anyone. A good example is Public Television. It is in the airwaves. Anyone can make use of it. Another example is the Mississippi River levee. If I live next to the river, I get its benefits the same as anyone else. Clean air is another one.
- ***Jointness of Supply*** - The supply of the good is inexhaustible. If I use some of it, it is still fully available to everyone. The Public Television is a good example again. If I chose to watch Public TV, it in no way reduces the amount of Public TV available to everyone else.

From this we would conclude that Public TV is a "Public Good". Note that this definition of "Public Good" is overly stringent and many shared objects do not completely comply with the definition. Nevertheless, the *social dilemma* problem arises whether the good is a strict "public good", as defined above, or not.

## • **Some [Examples](#) of Social Dilemmas**

If this is more than an academic exercise, then there must be [real world examples](#). I have started a collection of examples in a separate essay that can be accessed through this link.

## • **The Tragedy of the Commons**

The scenario, "The Tragedy of the Commons" (TOC), is also a Social Dilemma but is a little different in structure than the PD scenario. It represents a very serious problem of society, one that is even more common than the PD representation. It is basically characterized by "public goods" and "freeriders" and the fact that it is in the, *rational*, best interest for an individual sharing a public good (i.e., *common good*) to free-ride. I call this problem ["The Voter's Paradox"](#) and discuss it in detail in [that essay](#).

The defining characteristic of the TOC, is the concept of the "[common good](#)". First off, common good is difficult to define -- see the book review of Michael Novak's [Free Persons and the Common Good](#) at FFF. There seems to be a difference in meaning between "*the* common good" and "*a* common good". "The common good" seems to be based upon the differentiation between the things that are good for individuals and the things that are good for everyone, the public welfare. For example "equality before law" might be considered a component of "the common good" and "winning your speeding ticket case" would be an individual or private good.

Herein, when I talk about "a common good", I usually am making no distinction between that expression and the expression, "a public good" although in the literature a distinction is sometimes made. We don't require the precise definition given for "public good" when we mention "a common good".

Note that some distinction still needs to be made in what we mean by *common*. Are we talking about our community, our nation, or the world? All are allowed -- we just need to make sure we specify the scope, for a common good in India could likely not be appropriate in the U.S., for example.

A comprehensive paper that discusses the concept of "common good" and the various definitions is available on the internet as "[THE COMMON GOOD IN PHILOSOPHICAL LITERATURE AND EGO TRANSCENDENCE FOR THE COMMON GOOD IN PSYCHOLOGICAL LITERATURE](#)" by Jacqueline B. Magness, which is a chapter in her dissertation, "[The Genesis and Gestation of a Justice Journey: Catherine Pinkerton, CSJ, Champion of and Educator for the Common Good](#)".

The abuse of the "common good" by the government is discussed in my essay, "[Individual Rights and Freedoms v. The Common Good](#)", online at the "Limited Government" site.

More on The Tragedy of the Commons:

- Original article with this title by Garrett Hardin appeared in *Science*, 162:1243-1248, 1968.
- A copy of the [original essay](#) is now online.
- A related phenomenon, "The Matthew effect", is discussed in the online essay, [Growing the Global Good in the Information Age](#), by Philippe Quéau. The effect is named after the quotations from the Bible, [Matthew 13:12 and 25:29](#), which basically says that "them that has gets, and them that don't lose".

- **The Volunteer's Dilemma**

"Facing Major Major Major Major's rebuke for not wishing to fly any more bombing missions over Italy, Yossarian contends that the bombs he could drop would make little or no difference to his eventual well-being, while the risks involved in dropping them might make an enormous difference to him." - Russell Hardin commenting on Heller's *Catch-22* in his book, *Collective Action*

A few years ago, the newspapers reported a tragic story about the murder of Kitty Genovese. Thirty-eight people watched and listened as the Queens, New York, resident was raped and stabbed to death in the courtyard of her apartment complex. Though she screamed for help for an hour and a half, no one called the police until the attack was over. This gruesome episode well illustrates the problem of the *Volunteer's Dilemma*. In his book, [Prisoner's Dilemma](#), [William Poundstone tells of several forms of this dilemma](#) but the classic example is given by the story about what soldiers in a trench are suppose to do if a live grenade falls into it. If one soldier will fall on the grenade, he will die and the rest will survive. If no one falls on the grenade, they all die. What should the individual soldier do in the few seconds he has to make a decision? The choices are "die" or "maybe survive". "Maybe survive" would get most people's vote but to do that you must not volunteer (that is, wrap yourself around the grenade)! An essay by J.O. Urmson, "Saints and Heroes", is considered to be the best treatment of this subject. The essay is included in the books, *Moral Concepts*, ed. Joel Feinberg (London: Oxford University Press, 1969) and A. I. Melden's *Essays in Moral Philosophy* (Seattle: University of Washington Press, 1958). An online reference is the article by Gregory Mellema, ["Beyond the Call of Duty"](#).

It appears that when there is some kind of undesirable activity going on in which the intervention of others could stop it, people are reluctant to act if there is more than one observer present. Each waits for the other to do something. Experiments have shown that the more people there are present, the less likely any individual will take action!

This problem, which is very representative of Social Dilemmas which generally do not have a technical solution, is related to the game of ["Chicken"](#) and the game of ["Take it or Leave it"](#). Efforts to overcome this problem by legal methods are discussed by Prof. Eugene Volokh, in ["Duties to Rescue and the Anticooperative Effects of Law"](#).

- **To learn more about Social Dilemmas, check out these links:**

- My essay on the fundamentals of [Social Dilemmas](#) is available at various sites on the Web including [The Ethical Spectacle](#) special issue mentioned above. For your convenience, I have provided a [brief introduction to the Social Dilemmas](#) at this site. My, overly ambitious, [comprehensive essay on Social Dilemmas](#) in its current state of incompleteness is provided at this site.
- A good start for the serious student is Hobbes [Leviathan](#), which is on the net in several places. I got my copy at [the Alex 'etext' site](#), which has many other classic texts in electronic form.
- Some papers on modeling of the Social Dilemmas originally developed at the [PARC site](#).
- My essay on the ramifications of the Social Dilemmas, titled "A Cooperative Society Composed of Selfish Individuals", was published in the UXU ezine and is available [here](#). My argument that the individual is totally helpless in modern societies is presented [here](#).
- The essay, [The Common Good and the Voter's Paradox](#) co-authored by myself and Mack Tanner that appeared in the magazine, *IDEAS*, August 1992.
- References that Discuss the Concept of [Public Goods](#)
- An excellent introduction to the concept of [Public Goods](#), Cliff Landesman's dissertation, "The Voluntary Provision of Public Goods".
- Newsgroups and Interest Groups on the Internet.  
I'm still looking. The above comments under Prisoner's Dilemma apply as well to Social Dilemma interest groups.
- Other References are [below](#).

## Theory and Analytical Methods

### • Game Theory

A reasonable definition of *Game Theory*, as provided by the Columbia Encyclopedia, is:

#### **Game Theory**

"Group of mathematical theories, applying statistical logic to the choice of strategies in a game. A game consists of a set of rules governing a competitive situation in which two or more individuals or groups attempt to maximize their own winnings or minimize their opponents. Game Theory, first developed by John Von Neumann, is applied to many fields, e.g., military problems and economics."

Game Theory provides a methodology for analyzing interactions between players more than it provides solutions. While it has had some success in analyzing the Prisoner's Dilemma, it hasn't provided much insight into the general Social Dilemma problem.

A good introduction to Game Theory is available from Roger A. McCain's course notes. Click here for an [introduction](#) and a table of contents for the complete set.

- **Non-Zero-Sum Games**

*Zero-sum* games are models of situations in this world in which the total rewards of a transaction is zero. That is, whatever you gain, I lose and vice versa. For example, let us say you give me \$5. You are now down minus \$5 and I am now up \$5; the sum for the two of us did not change. Such transactions are relatively simple.

Unfortunately in the real world, the sum of the transaction rewards is rarely zero -- which results in a much more complicated scenario. Let us say I would value a certain old Hank Williams phonograph record at \$50 and you wouldn't give two cents for it. But you find one in the attic of the old house your old house. You offer it to me for \$20 and we make the trade. After the trade, my situation is I have give up \$20 and gained \$50 (in value) for a net result of plus \$30. You, on the other hand have increase the value of your holdings by \$20 (the 20 dollar bill that I gave you). So the net result of this "game" transaction is plus \$50 -- definitely a *non-zero-sum game*.

The Prisoner's Dilemma and the other Social Dilemma games studied in these essays are all *non-zero-sum*. To learn more about these games just search the web as there is thousands of articles on the subject! A good place to start would be ["Non-Zero-Sum Games"](#), by Janet Chen, Su-I Lu, and Dan Vekhter.

- **Nash Equilibrium**

The movie and book, *A Beautiful Mind*, by Sylvia Nasar, about the mathematical genius John Nash has given the public an awareness of "Game Theory" and probably a new incentive for students to want to go into that field. John Nash made a major contribution to the analysis of games when he developed what is now called the "Nash Equilibrium", in which he defined ". . . an equilibrium of a noncooperative game to be a profile of strategies, one for each player in the game, such that each player's strategy maximizes his expected utility payoff against the given strategies of the other players.",



quoted from "[NASH EQUILIBRIUM AND THE HISTORY OF ECONOMIC THEORY](#)", by Roger B. Myerson.

Unfortunately, the Nash Equilibrium, does not necessarily yield the "best" result (in the sense that we would all be better off if we cooperated with each other). In particular, the Nash Equilibrium for the Social Dilemma prototype, the "Prisoner's Dilemma", is for both parties to defect. So, it appears that the Nash Equilibrium may be a useful tool in analysis of games but is not necessarily a good indicator of what ought to be done in real life. It appears that the Nash Equilibrium can be equated with what we call "rational" and we have seen in these pages that "rational" actions do not always result in the best interests for the group.

A more complicated game that also illustrates the problem of an undesirable Nash Equilibrium is the game, "[The Traveler's Dilemma](#)", as described in a classic paper by C. Monica Capra, Jacob K. Goeree, Rosario Gomez, and Charles A. Holt.

A short description of this game is given at the "[veconlab.econ.virginia.edu](#)" site:

The discussion can be motivated by a story of two travelers who lose their luggage with identical contents, and the airline official tells them to fill out claim sheets independently. The representative promises to reimburse claims fully if they are equal, but to assume that higher claims are falsely inflated and in this case to only give each person the minimum of the claims. In addition, a reward of  $\$R$  is given to the low claimant, and an equal penalty is deducted from the compensation for each of the others. Discussion can lead to the discovery that only the lowest feasible claim is a Nash equilibrium. Deviations from this equilibrium are not surprising if  $R$  is relatively low. See Capra et al. "Anomolous Behavior in a Traveler's Dilemma," American Economic Review, June 1999.

Let me elaborate a bit. Let me first add that the travel agent sets upper and lower limits on the claims, e.g., "anything from \$50 to \$300". The situation is that the low claimant will get the minimum claim plus  $R$  dollars and the high claimant will get the minimum claim minus  $R$  dollars. Let us say the two claims are \$210 and \$250 (after the discussion of this game in "[Ten Little Treasures of Game Theory and Ten Intuitive Contradictions](#)" by Jacob K. Goeree and Charles A. Holt). Then the low claimer gets  $\$210 + R$  dollars and the high bidder gets  $\$210 - R$ .

We can do a Nash analysis of this game without specifying the value of R. Mathematically it doesn't matter. Let us consider that R is \$20 and we take a look at the maximum, \$300. Well that is not a good bid, for the other guy can bid \$299 and he will get \$319 and I will get \$279. Not good. So \$300 is out. But so is all the rest of the possibilities down to the minimum, \$50, for the same reason. So we both bid \$50 -- and that is the Nash Equilibrium for this game. Again, I want to point out that this is true regardless of what the value of R is.

But in real life, people bid differently depending on the value of R. For low values of R, the bids tend to be high, as you would expect. See the references for details of actual tests with students playing the travelers' roles.

- **Rational Choice Theory (Social Choice, Public Choice, Collective Choice)**

*Rational Choice Theory* is concerned with the decisions a rational individual should make in an individual or collective environment and is the basis for Social and Public choice theories. *Social (or Collective) Choice* is dedicated to the particular problem of choice in a collective environment. *Public Choice* is directed toward [public goods](#) including governmental administration. The major question is: in a social, public, or collective situation, and a choice concerning the individual's contribution must be made, how is that choice to be *rationally* decided? It turns out that the answer to this question is very difficult and fraught with paradoxes and dilemmas. Social scientists have made great progress in *understanding* the problem, but little progress in identifying *solutions*.

An extensive critique of the *rational choice* view is given by Michael Byron, Jr.'s dissertation, *Rationality and the Paradoxes of Decision Theory: A Critique of Rational Choice Views* and is recommended reading (unfortunately, the essay is no longer online and I have not found a published source for it).

An excellent book on the subject that provides both a critique of the failures of Rational Choice Theory as well as an introduction to the concepts involved is the book, *Pathologies of Rational Choice Theory* by Donald P. Green and Ian Shapiro, (Copyright 1994, Yale University Press).

Some links on the net: Hans O. Melberg's essay on "Three arguments about rational choice theory in sociology" (now offline), and a list of Jon Elster's many papers, books, etc., (now offline) on the subject.

- **Politics, Elections and Social Choice**

While the media and the politicians rant on about why don't more people vote, the philosophers know that the real question is why does anyone vote!

For now the best reference on this subject that I can suggest is a book by Geoffrey Brennan and Loren Lomasky called *Democracy and decision*, 1993, published by Cambridge University Press. Dr. Lomasky also has an article titled "The Booth and Consequences", subtitled "[Why Vote?](#)", in the November 1992 issue of *Reason* magazine where he is a contributing editor. Both the article and the book present a very even handed, factual account of this field and -- most refreshingly -- they are not your usual liberal pap or conservative hysteria.

An interesting article from the *Journal of Mathematical Sociology*, 1985, "The Human Brain, Social Conformity, and Presidential Elections", by Stephen Coleman, suggests -- with supporting evidence -- that people who vote and their selection of a candidate are mainly conforming to social norms. He further says, "If a society is conformist to a certain degree in getting people to vote, it will be conformist to the same degree in how the vote divides among the political parties." So much for critical and objective analysis by the electorate!

For my view on the sloppy thinking involved with "wasting your vote" (when you vote for candidate that is not a Republican or a Democrat), see the essay, "[How to Avoid Wasting Your Vote](#)" (A slightly shorter version is at [The Vagabond](#)).

- **Economics and Public Choice Theory**

*Public Choice Theory* has resulted from an application of *Economics* and *Rational Choice Theory* to the political environment. Credit for establishing the theory usually goes to James Buchanan and Gordon Tullock primarily from their book, [The Calculus of Consent](#) which they published in 1962. Their work is particular appealing in that it is, according to Buchanan, based on [common sense](#) instead of *romance*. I quote from an [interview of Buchanan](#): "[Public Choice] is nothing more than common sense, as opposed to romance. To some extent, people then and now think about politics romantically. Our systematic way of looking at politics is nothing more than common sense." My essay, "[An Introduction to Public Choice Theory](#)", provides a limited introduction to this fascinating science.

"Public Choice" theory is closely related to the "Public Economy" field of study. I quote from the book, [\*Political Economy in Macroeconomics\*, by Allan Drazen](#):

Public choice and political economy as defined here are clearly closely related. Many treatments of the new political economy would not make a distinction between the fields, arguing that public choice is an integral part of the new political economy. . . . Our interest is in the *effect* of politics on economic outcomes, not on politics *per se*. Though the stress is on using tools of economic analysis, the interest is not in choice mechanisms themselves.

A partial text on the *Theory of Public Choice* is now available on the internet. This outstanding and comprehensive essay is provided by J. Patrick Gunning at his site, [UNDERSTANDING DEMOCRACY](#) (complete text seems to be online at [BNET](#)). While you are at that site, you might want to click on the "Go back to Home" link at the bottom of the page to see other relevant material.

I have made an effort to look at politics with common sense in my essay on [Political Realities](#). To learn more consult the references, particularly books by Buchanan, Olson, Hardin, and Taylor.

My views on whether humans are actually rational or not are presented in ["Humans are Rational, aren't they?"](#).

When I find more good links to material on the net covering this subject, I will add them.

## • **Computer Modeling**

The most extensive computer modeling of Social Dilemmas that I am aware of is the work done by Bernardo A. Huberman and his cohorts at the Xerox Palo Alto Research Center. Fortunately, much of his work is available on the internet. You can access the list by following this link to their [Dynamics](#) site. Most of the papers are in postscript but if you have trouble displaying them, you might be able to get a paper copy by writing to Dr. Huberman and requesting same. A summary article on this issue, "The Dynamics of Social Dilemmas", by Bernardo Huberman and Natalie Glance also appeared in the March, 1994 issue of *Scientific American*.

## **Solutions to the Social Dilemmas**

- **Morality**

There are some who believe that *morality* may be a solution to the Social Dilemmas. I have an essay, entitled "[A Rational Justification For Ethical Behavior](#)", that discusses this possibility and suggests that the Social Dilemmas may be a rational basis for an essential set of morals.

- **Memes**

The human mind seems to be highly susceptible to accepting a large passel of unexamined beliefs ("[memes](#)") -- from which the human then blindly follows. That being the case, the *meme* would seem to be a powerful tool for eliciting cooperations from the masses. Like all powerful tools, unfortunately, it can and is much misused.

Some of my thoughts on "memes" are contained in the article, "[Common Sense](#)".

- **Government**

Many believe that *government* is the only practical solution to the Social Dilemmas. The philosopher [Hobbes](#) emphasized the idea that all people would be at war with each other without the force of government to control them. The justification for government is often based on the Social Dilemmas. The "Catch 22" is that government itself brings along a passel of Social Dilemmas as bad or worse as the one it is supposed to solve. Elinor Ostrom, in her book [Governing the Commons](#), discusses this problem of "Dilemmas nested inside dilemmas" stating, "Because supplying a new set of rules is the equivalent of providing another public good, the problem faced by a set of principals is that obtaining these new rules is a *second-order collective dilemma*." (Emphasis added). Specifically, if government is invoked to solve the social dilemma, then government, being a public good itself, provides a new social dilemma possibly much worse than the original! More on the ramifications of the government solution in my essay on "[Simple Theory of Politics \(STOP\)](#)".

Many people make a logical error -- the so-called "[False Dilemma](#)" argument -- in assuming that government is the solution to the Social Dilemmas. The argument is based on the idea that "given the claims A and B, if A is false, B must be true". That is, we know that free enterprise fails when it comes to the problem of public goods so government must be the answer! Wrong. Government could be worse. See the article by Adam Przeworski, "[A Better Democracy, A Better Economy](#)" that discusses the problem in a somewhat even-handed way.

- **Religion**

Assuming that cooperation results in a greater good for everyone, *religion* has some merit for it can elicit that cooperation. Unfortunately, to do so, it often resorts to deceit, fear, and manipulation. The question then becomes, does the end justify the means?

- **Privatization and Metering**

If a public good can be privatized -- and many can not be -- then by privatizing, the forces of the free market can be brought to bear which can sometimes solve the problem. Examples would be toll roads instead of public roads and dividing up the commons into individually owned (or rented) plots. Metering<sup>[1]</sup> of usage could also solve many problems. For example, to keep people from wasting scarce water, each user's consumption could be metered and they could be charged accordingly. More on this solution in my essay on "[Solutions to the Voter's Paradox](#)".

- **More on Solutions**

Mark Irving Lichbach provides the most comprehensive discussion of potential solutions to the Social Dilemmas in his book, *The Cooperator's Dilemma* (University of Michigan Press, 1996). I say potential solutions since all the solutions he proposes have serious defects. Here is a list of solutions he proposes:

- Market

The *Market* solution is based on modifying the "cost/benefit" equation so that the benefit to the individual exceeds the cost. The main problem with this approach is that is simply not possible for many public goods.

- Community

*Community* solutions are based on the idea that members of the community can develop common understandings that they will act together. Of course, this relies on trust which is not practical in many communities. The main problem, however, is that this solution requires that people be altruistic rather than egoistic, which is, practically, not very realistic.

- Contract

*Contract* solutions are based on the concept that individuals can recognize that human weaknesses include the problem of free-riding and defection and therefore may make contracts between themselves to severely punish such actions. The problem is that someone must enforce these contracts and therefore a *police* agency must be established. This, of course, is the beginnings of government and we know where that will lead us!

- Hierarchy

This concept requires that an hierarchical organization exist with enough power at the top to enforce the needed cooperation. Of course, we are talking about government here as Hobbes described it in his works. The problems resulting from this solution are major, as is discussed extensively in these essays.

For further discussion of solutions, refer to my own essay on [Solutions to the Voter's Paradox](#).

## Games and Puzzles

No, not Game Theory, but games that you can play. There are a few [games and puzzles based on the Social Dilemma](#) idea that are somewhat amusing. Much more effort is really needed here.

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## Notes:

1. By *metering*, I mean the charging for the use of a good based on its economic value or cost.

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