# Resource Conservation: How Environmental Nonprofits Facilitate Long Run Optimal Resource Allocation.

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## 1. Introduction

Every year, open spaces are developed and species are threatened by loss of habitat. A lack of resource protection leads to environmental degradation and inefficient use of valuable natural resources. To protect these resources and the benefits they provide, various actions are taken to control land use and maximize the benefits of the land. Some of these benefits will be realized privately by land owners and those living near the protected land. Other benefits flow to a much broader social group.

The effects of conservation reach beyond private benefits and costs due to externalities. There are a variety of positive externalities associated with resource protection that provide social benefits. These benefits are often referred to as ecosystem services. Some commonly identified ecosystem services are biodiversity, water filtration, air purification, species protection, soil quality regeneration, and nonuse values such as existence and bequest value. An important consideration in the case of resource protection is the long run effect of decisions made today. These decisions will in fact have an effect across many generations and so must be valued across time. Economic theory notes that goods providing a social benefit will be underprovided by the private market. To maximize social welfare, these goods should be provided beyond the private market allocation. This thesis identifies how nonprofit organizations can alleviate the market underprovision of resource protection[1].

A common way to protect these resources is through land conservation. To prevent development on resource-rich land, private and governmental entities take a variety of conservation measures to promote social welfare. However, land conservation methods greatly differ. Methods of government zoning, direct land purchases and

[1] Resource protection and land conservation are used interchangeably throughout this thesis.

conservation easements will be explored. Conservation easements, which are analyzed in greater depth, appear to maximize social welfare and distribute benefits and costs equitably as I will discuss in section 3.

In my analysis, I identify three types of benefit: private benefit, proximity benefit, and social benefit. Proximity benefit is a private benefit incurred by those living near the conserved land and gaining benefit from increased property values, aesthetic pleasure, and other benefits from land conservation. Proximity benefit is a function of distance and comprised of the sum of all individuals receiving this benefit. This same concept holds true for cost analysis.

Once the need for intervention in the market for resource protection is recognized and easements are proven to be a good tool for conservation, the question arises: who can best supply easements? Suppliers of easements could be the government, a private, for-profit organization, a private, nonprofit organization, or any combination of these three entities. In consideration of how to best reach a long run optimal amount of resource conservation, this thesis argues that nonprofit organizations partially funded by the government can most closely and equitably reach the socially optimal level of resource conservation.

## 2. Literature Review

The review of literature for this thesis focuses on the relationship between government and nonprofit organizations and the common method of using conservation easements for land conservation.

The first article I reviewed explores the possible differing relationships government and nonprofits may experience (Young, 2006). Young identifies supplementary, complementary and adversarial government-nonprofit relationships. He offers the solution to the problem of public good underprovision. He recommends that the government finances the public goods while not providing them. Private suppliers may have lower production costs and greater information allowing for a beneficial relationship in which government contracts with knowledgeable and more cost efficient nonprofits. Contracting with a private for-profit firm would achieve many of the same benefits but the profit-driven motive would lessen the trust for this type of firm, raising cost of monitoring to the government.

Looking at the three government-nonprofit relationships, Young identifies different times in history for which each relationship was appropriate. He concludes by illuminating the problems we face today as a result of a changing social contract. While the primary relationship is supplementary, a more complete social contract could be achieved by employing aspects of all three relationships.

I focused on Young's analysis of supplementary and complementary government-nonprofit relationships. This article addresses many broad reasons why and how the government would contract with nonprofits. I hope to apply this research specifically to environmental nonprofits and combine the relationships he separates into a relationship between environmental nonprofits and governments dealing with land conservation issues.

The second article I reviewed looks at the common conservation method of conservation easements. Merenlender, Huntsinger, Guthey and Fairfax (2004) point out that easements are a preferable option for land owners as opposed to governmental land-use planning. Conservation easements allow for a separation of the property rights. These rights may be sold or owned by different entities allowing for a more efficient use of the land.

Since 1990, the nonprofit movement to increase land trusts has drastically spread (Merenlender et al, 2004). Many nonprofits have different missions giving land owners the option to conserve land through the organization of their choice.

The authors note that a better measurement is needed for the resources being conserved through easements. Because of the external variables associated with conservation, specialized knowledge would lead to more effectively implemented easements. Given the voluntary nature of easement acquisition, it is also important to have adequate information about landowner motivations for participation in an easement.

Impacts on the surrounding community are analyzed in this study. Merenlender et al (2004) talk about an equitable division of costs but recognize the difficulty in this task. The authors also mention the external benefits to those near the conserved land such as a rise in property values. They conclude that conservation easements are a good start to resource conservation but also that more information is needed to use easements as an effective conservation tool.

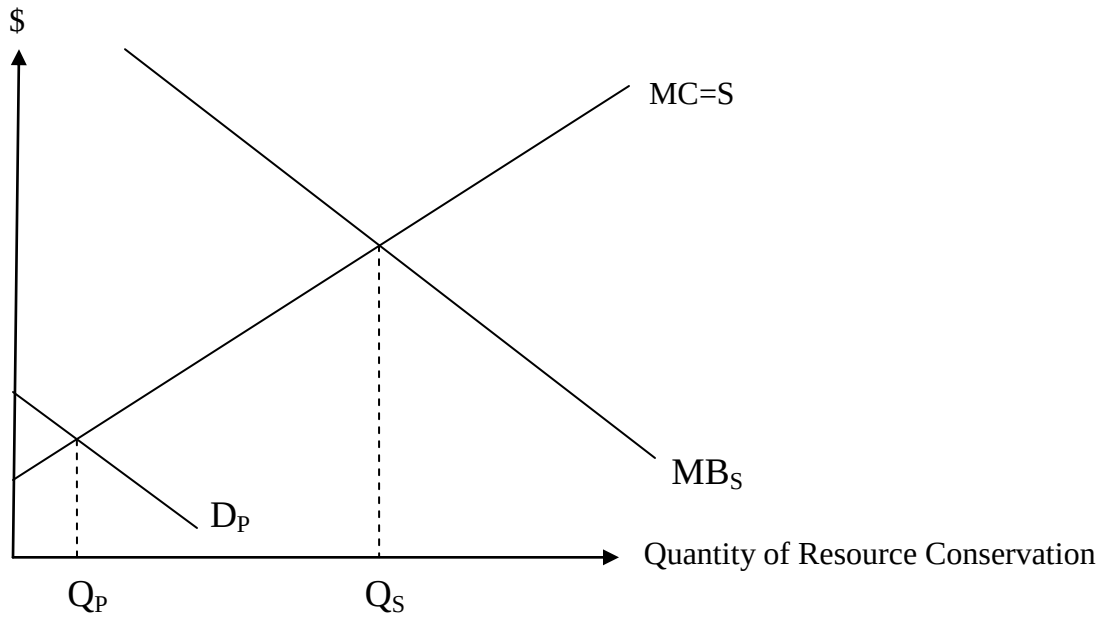
This article is useful to my research in that it emphasizes the importance of accounting for externalities associated with conservation. It specifically addresses the conservation tool of easements and why this method is better received than other

conservation tools. The authors mention the need for further research on benefit and cost distributions and social equity in land conservation decisions which I address in this thesis.

## 3. Long Run Benefits and Costs Associated with Resource Protection

In basic economic theory, market allocation of resources is determined by the private marginal benefit of these resources and the private marginal cost which reflects the forgone benefit of those resources in their next best use. When it comes to the discussion of resource conservation, the private demand will be very small, making the market allocation inefficient. In many cases, the revealed preference will be zero regardless of the true demand ($D_P$). Often, a good with positive externalities may not be produced at all due to the lack of voluntary payments. Yet, many goods of this nature are still provided. This is often due to market intervention through governmental or private organizations[2]. The diagram below shows private market underprovision where "Quantity of Resource Conservation" is measured by the number of parcels conserved as opposed to the decision to conserve or not to conserve.

[2] Resource conservation may also be voluntarily provided by individuals who experience a private marginal benefit exceeding the private marginal cost of conservation.

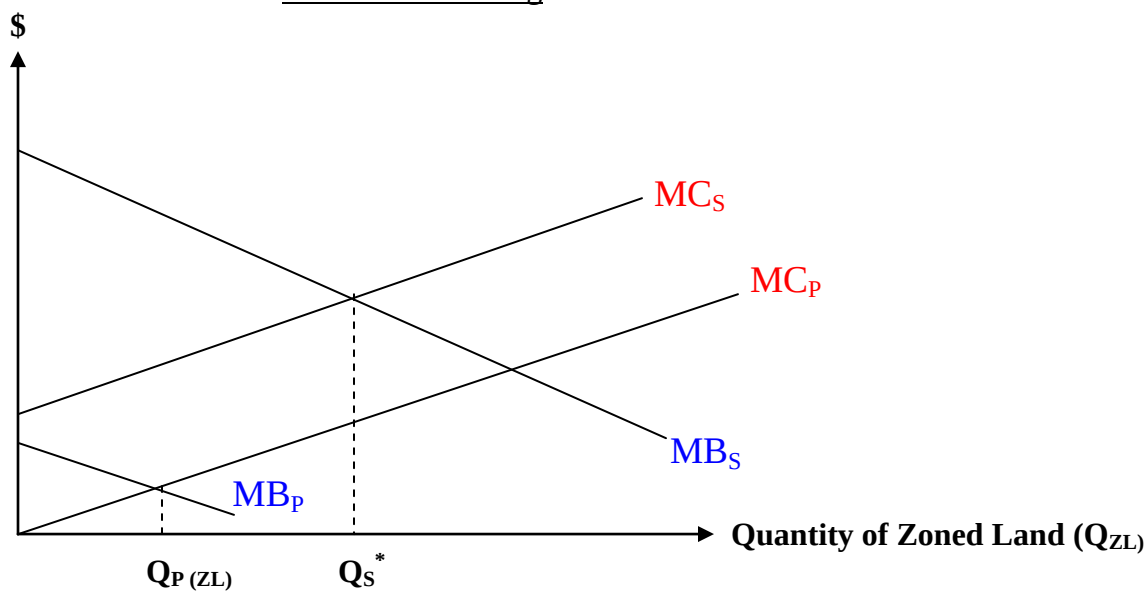



MC= S: marginal cost = supply
$D_P$: true private demand
$MB_S$: social marginal benefit
$Q_P$: private quantity produced
$Q_S$: socially optimal quantity produced

It is clear that market intervention is necessary in this general case to reach a socially optimal amount of resource conservation. Three groups will receive benefits and accrue costs in a land conservation transaction or decision. These individuals are categorized as: private (P), proximity (X), and social (S). To get a better idea of the specific benefits and costs involved in resource conservation and to compare the magnitude of these effects in various situations, I would like to explore three different cases for land preservation. The weight of benefits and costs imposed on each group has the potential to greatly differ between alternative conservation methods. I have included graphical representation of social and private costs and benefits. A written analysis is given for all three groups: private, proximity and social.

The first case to consider is the case of a government mandate or implementation of zoning laws that completely restrict development. Through legislation, the land would be zoned, eliminating future private revenue for which the land owner often would not be compensated. Other methods such as transfer development rights, for example, would often give compensation of the fair market value of the land. This may not be the case with zoning.

Government Zoning




The private marginal benefit to the land owner is very low in this case. As discussed above, they may not be compensated adequately (if at all) for the lost use of their land. The private benefit will be the compensation value given to the land owner.

$$\text{Private Benefit} = B_P = \text{compensation value} \qquad (1.1)$$

The proximity benefit here is the value received by individuals living in a certain proximity to the land. Some individuals near conserved land may have preferences against conservation which would have a negative effect on their utility. My model only holds for positive proximity benefit values but it is important to recognize the possible negative outcome.

$$\text{Proximity Benefit} = B_X = \sum_{d=1}^{m} \sum_{i=1}^{n} V_{di} \ , \ \forall V_i \geq 0 \qquad (1.2)$$

where d= distance,
m= furthest distance receiving proximity benefits,
i= individuals,
n= individuals receiving proximity benefits, and
V= value received.

Each individual receiving proximity benefit is summed up to equal the total proximity benefit. This value is determined by the distance from conserved land[3]. Examples of proximity benefit include increased land values, aesthetic pleasure and increased neighborly connections. The social benefit is realized by all members of society and is comprised of external benefits labeled as ecosystem services.

$$\text{Social Benefit} = B_S = \sum_{i=1}^{p} g_i + B_X + B_P, \qquad (1.3)$$

where g= external benefits from ecosystem services, less external proximity benefits
i= individuals and
P= population[4].

[3] Here I assume that $(\partial B/\partial d) < 0$ where B=benefit and d=distance from conserved land. I also assume a constant density from d=1 to m.
[4] $P \geq m$.

As seen from the diagram, the private marginal cost to the land owner is very high compared to their marginal benefit from government zoning. The private costs are the land owner's forgone benefits from development. Government control over land may have additional proximity costs to other external costs caused by land conservation through zoning. In addition to these external proximity costs, resistance to government control[5] may have additional negative impacts on the utility of those living near the zoned land.

$$\text{Private Cost} = C_P = FDB, \tag{1.4}$$

where FDB= foregone development benefit.

$$\text{Proximity Cost} = C_X = GC, \tag{1.5}$$

where GC= government control.

The social cost is the opportunity cost of the conserved land. The next best use for this land may be development, a specific agricultural use or another alternative to conservation. Social cost includes private and proximity costs as well.

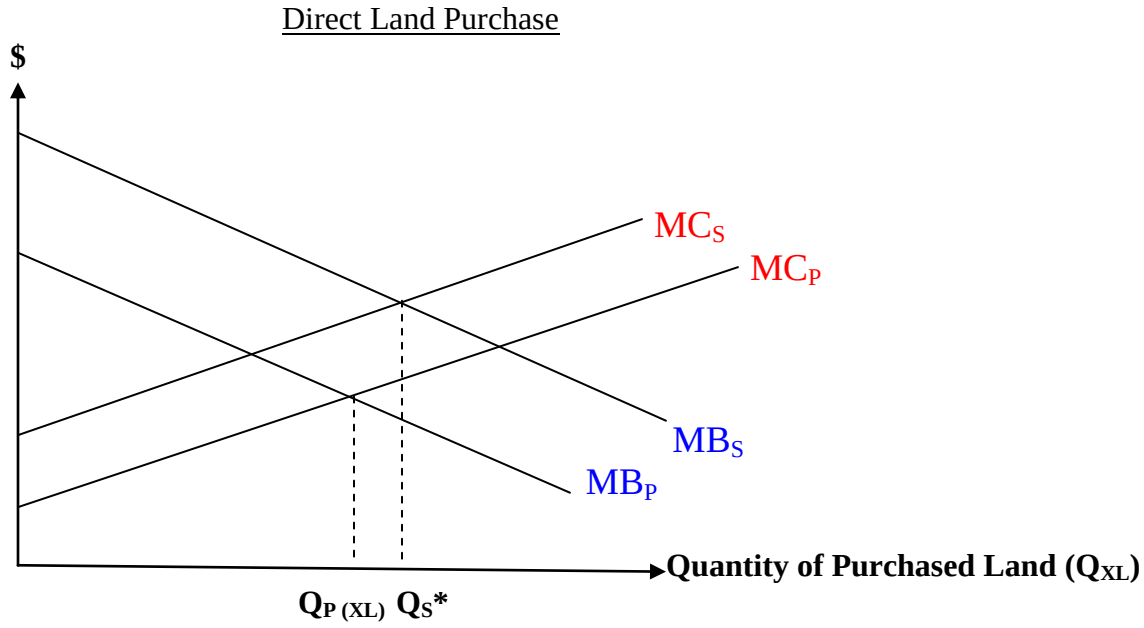
$$\text{Social Cost} = C_S = O_C + C_X + C_P, \tag{1.6}$$

where $O_C$= opportunity cost of land.

[5] Here I assume that $(\partial C/\partial g) > 0$ where C=cost and g=amount of government control.

If the government were to regulate land conservation to the socially efficient amount ($MC_S$=$MB_P$), the marginal cost to the land owner at this quantity of zoned land greatly exceeds their marginal benefit.

The second case to consider is a direct land purchase by a private entity.




The private and social benefits in this case are greater than in the case of government mandated zoning. The proximity benefit is comparable to that in the previous case of government zoning. The private benefit is greater because the land owner will receive compensation equal to the fair market value of the land. Compared to unlikely compensation from the government for lost benefits due to zoned land, this private benefit will be much higher. Consequently, the social benefit will also be higher as it is comprised of private and proximity benefits.

$$B_P = LS, \quad (2.1)$$

where LS= land sale.

$$B_X = \sum_{d=1}^{m} \sum_{i=1}^{n} V_{di}, \ \forall V_i \geq 0 \quad (2.2)$$

$$B_S = \sum_{i=1}^{p} g_i + B_X + B_P \quad (2.3)$$

The costs associated with the method of purchasing land differ from the previous method for conservation. Private costs are forgone development benefits but also lost income from the current use of the land.

$$C_P = FDB + LICU, \quad (2.4)$$

where LICU= lost income from current land use.

Proximity costs will slightly differ as well. If land is conserved by a private entity there will no longer be negative utility from government control. Instead, there may be some cost to those who prefer the land owner (their neighbor) to have control over the land versus a private entity. The proximity cost will also include lost local income.

$$C_X = LLR + PC, \quad (2.5)$$

where LLR= lost local revenue and
PC= private control[6].

[6] Here I assume that $(\partial C_X/\partial PC) > 0$ where $C_X$= proximity costs and PC= private control.

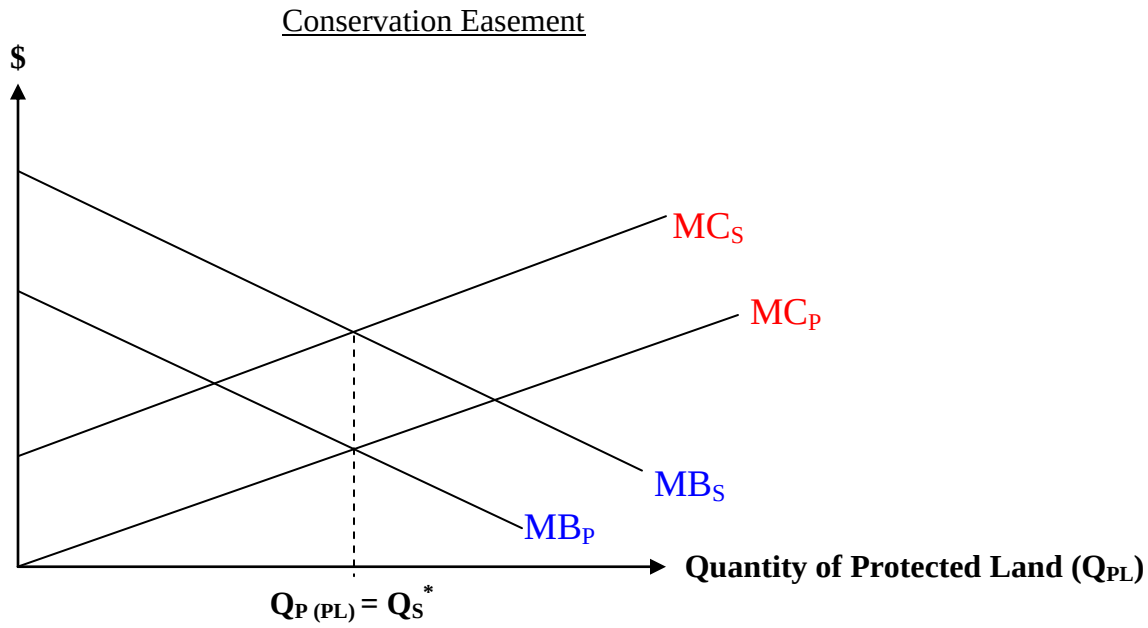
The social costs would include private and proximity costs as before. This conservation method of a direct land purchase comes at no additional cost to society beyond the opportunity cost of conserving the land. Revenue used to purchase the land for conservation will come from donations to the private organization made by those who receive utility from their donations. If the government were to directly purchase land for conservation, there may be an increased local tax burden to subsidize this purchase. However, this case considers the purchase made by a private organization.

$$C_S = O_C + C_X + C_P \qquad (2.6)$$

Unlike the case of government zoning, land purchases will be voluntary. The private outcome ($Q_{P\,(XL)}$) in this case is near to the socially optimal outcome ($Q_S^*$) but it will become clear in my upcoming analysis that the private market allocation for land conservation can be even closer to the socially optimal amount using conservation easements.

The last case to consider is protecting resource through a conservation easement. A conservation easement is a purchase of the development rights. This differs from a direct land purchase in that the land owner can still use the land in a way that generates revenue. The next section of this thesis describes conservation easements in more detail and explains the methods for determining the price of easements. For now, I will

continue with the analysis of costs and benefits distributed between private, proximity and social groups.




The private benefit here is less than that of a direct land purchase but greater than government zoning. Because of the benefits the land owner will still receive from using the land, the easement sale will be less than the purchased land sale. Another option for land owners is to donate their land to an easement and receive tax benefits. The Tax Reform Act of 1976 allowed for the contribution of a conservation easement to be tax-deductable up to the appraised amount of the easement. The combination of these two private benefits for conservation easements comprises the total private benefit.

$$B_P = ES\ (r) + TD\ (s), \qquad (3.1)$$

where ES= easement sale (price per parcel of land),
r= number of parcels sold to an easement,
TD= tax deduction (easement value per parcel), and

S= number of parcels donated to a conservation easement.

The proximity benefit from conserving land through a conservation easement will be comparable to that of the two previous methods. The social benefit will be lower than the previous method due to the decreased private benefit.

$$B_X = \sum_{d=1}^{m} \sum_{i=1}^{n} V_{di} \;,\; \forall V_i \geq 0 \qquad (3.2)$$

$$B_S = \sum_{i=1}^{p} g_i + B_X + B_P \qquad (3.3)$$

The private costs accrued from land conservation through easements are less than the costs from a direct land purchase but the same as in government zoning. The private costs no longer include lost income from the current land use but are still the forgone development benefit.

$$C_P = FDB \qquad (3.4)$$

The proximity costs include dissatisfaction with private control which restrict possible future land use. Some individuals may receive negative utility from a permanent easement although in general, land conservation is well received by those living nearby.

$$C_X = PC \qquad (3.5)$$

Similar to the case of government zoning, the social costs will be lower than a direct land purchase.

$$C_S = O_C + C_X + C_P \qquad (3.6)$$

There are several assumptions I have placed on these models and limitations which I have made clear throughout my analysis. The purpose of analyzing and comparing these common methods for resource conservation is to be able to discuss the equitable distribution of costs and benefits in each case. Because of the imposition of various conservation methods on the private market for land use, it is important to think about how to most equitably achieve the optimal amount of resource conservation and to be aware of the inequitably distributed costs that are imposed by some conservation methods. As I have shown, this is the case with government zoning methods for conservation.

The social benefits are similar in all three methods. They are slightly altered due to differing private benefits. As long as the land is conserved the social group will receive the same external benefits from ecosystem services. The proximity benefits are comparable between all three methods of an easement, a direct land purchase and a government mandate as well. The private benefit greatly differs between all three methods. Protected land through government zoning is the lowest followed by easements

then by direct land purchases. Even though a direct land purchase has the highest private benefit, when costs are taken into account, this will not be the most attractive option.

On the cost side, private cost is the same between zoned land and conservation easements. Proximity costs are the highest when land is conserved through a direct land purchase. In addition to non-local control of the land (either by the government or a private organization), there will be lost local revenue. Proximity costs will be similar for the other two cases. In the case of a privately purchased piece of land, the social cost will be higher than the direct land purchase and conservation easement due to higher private costs. But in all three cases, the social cost does not differ drastically.

This brings us to the question: what is an equitable distribution of the costs associated with resource conservation? I will argue that the most equitable distribution of costs will be proportional to the benefit received by each group (private, proximity and social) from conservation. In this case, the conservation easement seems the most equitable strategy out of the three presented for land conservation division of costs. Shown in the diagram for conservation through easements, there will be no social welfare loss as the socially optimal quantity will be reached by the private market. Government zoning at the socially optimal amount imposes a huge marginal cost to the land owner and direct land purchases through the private market will not reach the socially optimal outcome, creating a social welfare loss.

Now that the equitable resource conservation method has been identified as conservation easements, what entity will be most likely to carry out this method of conservation? Conservation easements are becoming a more popular resource protection method among nonprofit organizations.

The next section better explains their nature and the methods used to calculate easement value.

**4. Conservation Easements**

Conservation easements are commonly used by nonprofit environmental organizations to protect land from development. These easements are agreements made between the land owner and an organization. Most conservation easements buy the development rights to the land which eliminates the option of development, at the same time allowing the land owner to maintain income from the land in its current use. The land is often used for agricultural purposes or as "working land." Easements allow for the continuation of benefits received by the land owner but take away the option for the land to be sold to developers.

Land owners will respond positively to conservation easements because they are voluntarily purchased which implies Pareto improvement on both sides of the transaction. Their nature is to provide private incentives for conservation. While government zoning laws would often achieve the same outcomes, the high imposed private costs would cause resistance among land owners. The full cost of lost benefits from the zoned land will be realized by the land owners. A more equitable strategy would be to compensate the land owners for their loss of development rights.

In order to successfully carry out conservation easement transactions, the value of the land must be known. This value reflects the landowner's willingness to accept the offer which includes their estimation of future forgone benefits. The land value is determined by the yearly agricultural rent and the yearly development rent. The price (P)

of a plot of land will be comprised of the value gained from agricultural uses each year until the year of development plus the development value from that year on.

$$P = \sum_{t=0}^{T^*} \rho^t A_t \quad + \quad \sum_{t=T^*+1}^{\infty} \rho^t D_t \qquad (4)$$

Where: t = time (years)
T* = the year the land is sold for development
$\rho^t = 1/(1+\delta)$, where $\delta$ is the discount rate
$A_t$ = agricultural rent
$D_t$ = development rent

Similarly, the price of a conservation easement should include the future expectation of prices. In order for a land owner to accept the easement, it must be greater than the value of the land determined by equation (1). This land value will include the agricultural rent received until the land is sold for development (time T*) in addition to the development rent they will receive at this time. The price ($P_e$) of an easement will be:

$$P_e = \sum_{t=0}^{T^*} \rho^t A_t \quad + \quad \sum_{t=T^*+1}^{\infty} \rho^t D_t \quad - \sum_{t=0}^{\infty} \rho^t A_t$$

$$= \sum_{t=T^*+1}^{\infty} \rho^t D_t \quad - \sum_{t=T^*+1}^{\infty} \rho^t A_t \qquad (5)$$

These price equations represent the present value of the land which takes into account the expected future value of the land. Because the time of expected land sale to development is unknown, organizations offering the easements must have information about specific land owners' willingness to accept easement payments. They must also have knowledge

about possible land uses in order to make a successful, social welfare maximizing transaction.

Now the question of who provides conservation easements is brought up. The next two sections will provide a clear picture of who sells conservation easements and which sorts of resource conservation suppliers have a cost advantage.

## 5. Suppliers of Conservation Easements

There are three supplying entities of resource conservation as with any other market good or service: government, private for-profit organizations, and private nonprofit organizations. In the case of resource conservation, who will deliver the optimal amount and who can do this most cost effectively? Analyzing each supplier will give insight to these questions.

### Government

Governmental decisions are often based on the majority opinion or the opinion of those with the most influence. Because there are so many external benefits offered from resource conservation, many individuals may not realize the value of these benefits and demand the wrong amount. The lack of information on the part of voting individuals will skew the demand for resource conservation to the left. Because the government acts on the behalf of those who vote, they will most likely underprovide this good.

The cost to the government to provide resource conservation incorporates the costs of information to effectively offer easements and the actual cost of the easements. The cost of information will depend on the level of government offering the easement.

National government will have more resources to dedicate toward research and easement conservation techniques but they will have a very high information cost. The local specificity will not be known and obtaining this information may be very costly. Even in the case of a local government providing resource conservation, they will not have the same information as an organization solely devoted to environmental wellbeing in that area. Governmental entities won't have the incentive to specialize in resource conservation which means they will never gain an informational cost advantage.

Recently, the "green" efforts of our county have held significant weight in international image. From the viewpoint of other countries, a governmentally led environmental movement may not appear to be as genuine and long term as a movement led by individuals and other private actors. Government provision of resource conservation may indicate a lack of individual motivation and integrity. On the other hand, if individuals speak their proactive values through private organizations, our national "green" image may be more credible.

The government image within our country may also affect a land owner's willingness to accept an easement. Historically there has been some resistance toward direct governmentally initiated measures. This negativity could raise the land owner's willingness to accept and so raise the cost of resource conservation.

Private, For-Profit Organizations

For private environmental organizations, an important source of revenue comes from individual donations. In order to receive donations, they must be trusted to carry out the values they represent which represent the values of the donor. Also, the donor

wants their donation to be put toward carrying out resource conservation, not paying for other costs to the organization. If some of their donation goes to the firms profit and then distributed to owners or used indirectly to support the organization, donors will be less likely to put their money there. Also, a for-profit organization does not receive tax exemption (unlike many nonprofits). This means that part of an individual's donation could be used to pay tax expenses. These circumstances lead to a lower level of trust between individuals and for-profit organizations versus non-profit motivated organizations.

For-profit organizations are motivated by profit. Profit can be gained by lowering costs and/or raising revenue. Firms often have the incentive to skimp on the quality of services they provide to lower their costs of production. Resource conservation is a long term service which is hard to monitor and requires trust between the involved parties. The nature of this good limits the accountability for delivering it given the difficulty to monitor the outcome.

On the other hand, for-profit firms will be able to be cost effective by taking advantage of economies of scale. Any profit received will not be restricted from distribution. Some of this profit would presumably be put into expanding the firm. They might hire more workers allowing for greater specialization, buy better equipment, or have the ability to outsource some of their work to improve efficiency.

Private, Nonprofit Organizations

Nonprofit organizations will also represent the values of their donors. As Paul B. Downing and Gordon L. Brady (1981) point out, donors will have preferences toward

more resource conservation than is currently being provided in order to make a donation. It may be that level of resource conservation is pushed beyond the socially optimal amount by nonprofit organizations because of the extreme values of the donors.

Nonprofit organizations have many cost advantages. The first is the tax exemption given to 501(c)(3) status organizations. Many environmental organizations will fall into this category as long as they do not exceed a given amount of lobbying efforts. Donors are also able to write off the amount of their donation from their total taxable amount. Nonprofits are subject to other tax benefits such as lower minimum wage requirements in some cases. Employees of nonprofit environmental organizations will be likely to accept a lower wage because of the external benefits they receive working for a firm whose beliefs align with theirs and where they feel their work is meaningful. These external benefits offset the lower wage they may receive which allows for lower production costs to their firm. Like other private organizations, nonprofits are able to take advantage of economies of scale. Even though they are not able to distribute their profits, they will be able to use any excess profits towards expanding the organization to improve efficiency.

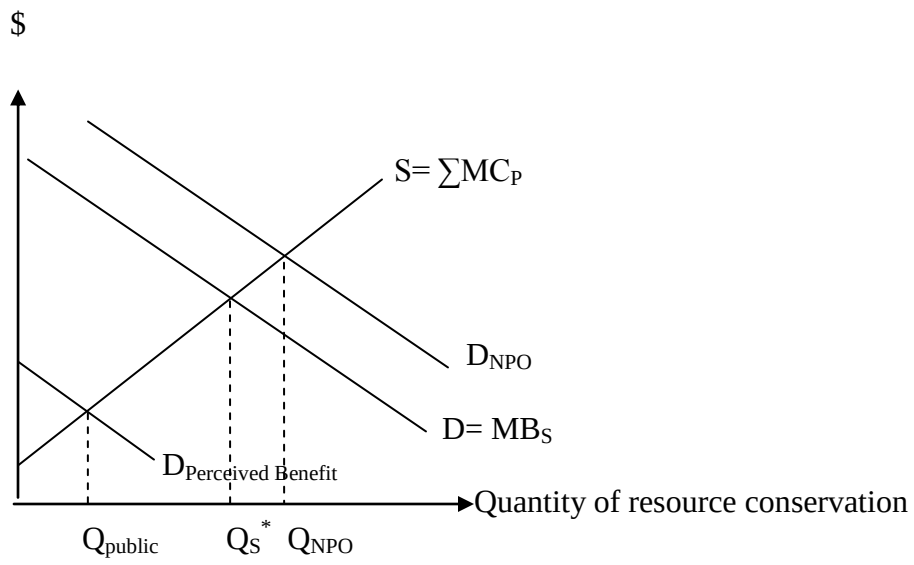
As discussed earlier, resource conservation is a public good and will therefore be underprovided. Those donating to an organization providing resource conservation will donate to the point of that cost being equal to the benefit they will receive. Because many people may not recognize benefits they would receive from a higher level of resource conservation, they will not donate. Given this obstacle in private funding, the nonprofit may not be able to get enough funding. This brings us to the next sections in

which I propose a more efficient and equitable provision of resource conservation by nonprofit organizations funded partially through the government.

**6. Governmentally Funded Nonprofits Providing Resource Conservation**

Attaining the Optimal Level

The optimal allocation of resource conservation must be known to state that governmentally funded nonprofits will best allocate resource conservation. The socially optimal level of resource conservation ($Q_S^*$) can be reached by providing conservation until the marginal social benefit of the conservation is equal to the summation of the private marginal cost to those providing the conservation. In this case, the private marginal cost will be that of environmental nonprofits. Part of this cost is reflected by the opportunity cost of the landowners when conserving land through easements.




Nonprofits providing land conservation through private funding alone will not likely reach the optimal level but the government can improve provision of resource

protection. Conservation will be inefficient in the absence of government aid. Although without government funding nonprofits may not have sufficient funds to carry out their missions, they may still target projects that represent more extreme values beyond what is socially preferred. Government funding will instill the influence of the public voice in the organization. This way, a more socially optimal level of resource conservation can be reached. Lack of information will lead the public to prefer less than the socially optimal amount ($Q_{public}$) and more extreme preferences of the nonprofit will lead to overprovision ($Q_{NPO}$). But when the two entities are combined, they can pull each other toward the socially optimal level.

In order for the government to successfully improve current allocation through financial support, they must have information about efficient resource protection. Without extensive research on possible conservation areas and the various approaches to protecting land, they will not likely provide financial support. Also, it is difficult for the government to differentiate between heterogeneous preferences given the system of voting to express individual preference. Nonprofits can overcome the information problem if they are knowledgeable about community needs. Many nonprofits focus on specific areas of conservation such as a geographical region or a habitat that is being conserved. They will employ experts whose jobs it is to identify the most effective and efficient way to protect the land. They will have more local information and experience and have the incentive to use their resources efficiently. The trust between the government and nonprofits aids efficiency in this way.

Cost Effectiveness

The cost effectiveness of environmental nonprofits in delivering resource conservation benefits the government and contributing individuals. Nonprofits have lower production costs because of their specialization in their area of conservation (region or conservation type), their lower accepted wage rate, and their tax exemption.

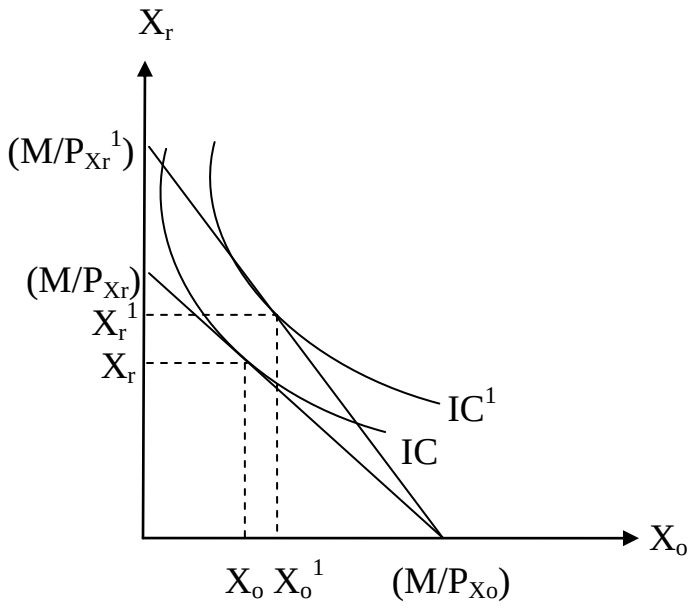
Readdressing the issue of equity, nonprofits funded partially through the government also better distribute costs across generations. Conversely in the case of privately funded organizations, the full costs are being realized by the current generation and unequally falling to donors when in fact future generations benefit from current resource conservation as well. Government allocation of tax dollars to financially support nonprofits spreads this cost to all taxpayers which better reflects an equal distribution of benefits and costs. The government budget is a dynamic account which is constantly accruing revenue through taxes. The money used to finance nonprofits will partially come from current tax dollars and will also be borrowed from future generations in expectation of future tax revenue. In this way, the costs of resource conservation will be divided among current and future generations based on the benefits each generation will receive. The government has the ability to borrow from itself, in a sense, to fund current projects.

The benefit of nonprofit organizations having a lower cost of production is that they can pass that cost efficiency on to individual donors and the government. Assuming that there will currently be underprovision of resource conservation given the nature of goods with positive externalities, a shift towards more conservation will bring the conservation level closer to the optimal amount. The cost of a conservation project will be partially funded by the government and partially by the organization's endowment

which is comprised of donations. In this way, the price of an individual donation is subsidized by government contribution and the government contribution is subsidized by individual donations.

$$M = X_r P_{Xr} + X_o P_{Xo} \qquad (6)$$

Given an individual budget constraint (equation 6) constrained by income (M) and the choice of spending this income on donations to resource conservation ($X_r$) and all other goods ($X_o$), the lower price of conservation offered by nonprofits will allow for a greater consumption of each good and a higher utility gain represented by the higher indifference curve ($IC^1$).




The same concept holds for the government. They have a budget constraint for government expenditure (M) and can choose to spend this money on funding resource

conservation (Xr) or other services ($X_o$). The price of resource conservation ($Px_r$) is lowered to ($P_{Xr}^1$) from subsidization by individual contributions and the lower production costs of the nonprofit make each dollar contributed go farther.

Another reason why it is cheaper for the government to financially support a nonprofit than a for-profit institution is the cost of monitoring projects. In some cases, the government may contract nonprofits to carry out specific conservation projects. In other cases, they may just financially support an organization that is delivering resource conservation through grants. In either case, monitoring of government spending is required to eliminate ineffective spending.

As identified by Herrington J. Bryce in "Players in the Public Policy Process," governmental objectives align more so with nonprofits than with for-profit organizations (Bryce, 2005). The latter is profit-driven while nonprofits and the government seek to improve social welfare. This convergence of interests leads to a more trusting relationship between the two entities. Because of this trust, extensive monitoring is not necessary. Limited monitoring to satisfy annual reporting to the IRS is sufficient. This likely would not be the case if government funds were going to for-profits providing resource conservation.

Trust between nonprofits and the government can also be achieved by the implications of the nonprofit's mission. When employees are willing to accept a lower wage, they are signaling that they are receiving positive external benefits from their job. They likely will have values that align with the mission of the nonprofit. Similarly for managers, they are driven by the passion they have for resource conservation and not by the profits they make. They will make managerial choices based on outcome versus

profit maximization. Because of the redistribution constraint of nonprofits, the managers wouldn't receive a higher wage, so have little incentive to make profit-based decisions.

Potential Problems

While I argue that nonprofit environmental organizations partially funded by the government can most equitably and cost effectively deliver the long run social optimal amount of conservation, I must recognize the potential downfalls of such a system. First, such heavy dependence on the government for financial support may lead to inconsistent delivery of services as funding changes. As administrations change every four years, the allocation of funds to resource conservation may drastically differ. Long term projects may be more risky to undertake with uncertain funding. In this way, such dependence on government funding could hinder the optimal allocation of resource conservation.

The second potential downfall of nonprofit organizations lies in negative stereotypes about nonprofits. They are often criticized for being inefficient due to the lack of profit-driven motivation. This may deter donations to nonprofits regardless of little evidence supporting the claim that nonprofits are less efficient than for-profit institutions.

The third problem with nonprofits lies in their ability to efficiently distribute conservation projects over the long run. While they are not profit-driven, they still need to ensure their organizations survival. These survival needs may bias conservation projects toward those with larger current benefits. The success of short term projects signals their success to the government and other individual donors so they would have the incentive to make decisions that guarantee long run survival.

This problem of survival-based decisions is shared with other private organizations. While the government may have the ability to better allocate conservation over the long run, other cost-inefficiencies and information problems would not make them the optimal choice for supplying resource conservation. Hopefully their funding would be allocated in a way that would incentivize nonprofits to analyze projects over the long run and fully realize these significant future benefits in their valuation methods and conservation decisions.

## 7. Conclusion

The underprovision of resource conservation by the private market leads to a significant social welfare loss. By analyzing the costs and benefits of three groups (private, proximity, and social) in three different land conservation situations, I was able to clearly see which technique most closely reached the socially optimal amount and the equitability in each case. Conservation easements provided in a private market allocate the amount which maximizes social welfare. Also, the distribution of costs between the three parties relative to the benefit they receive is fairly equal.

Conservation easements require much specialized knowledge and must be carefully carried out to successfully conserve land. Three entities could supply conservation easements. The first is government. They would likely underprovide conservation though due to an inaccurate demand by the public based on incomplete information about the benefits they would receive. Additionally, local information costs come at an extremely high cost to the government. Second, private, for-profit firms could supply easements. Higher costs are associated with for-profits such as tax costs,

higher demanded wages, and shareholder distributions. This leads to less trust between the organization and donating individuals. They might also skimp on services to cut their production costs. The quality of services would be hard to monitor given the long term and hard-to-measure benefits from resource conservation. The third supplier of easements is a private, nonprofit. They have cost advantages of tax exemption and lower accepted wage rates. Because of their mission and nonprofit status, there will be a greater level of trust between the organization and the donors. However, due to insufficient funding and extreme preferences, they may not achieve the socially optimal amount of conservation and will targeting projects that do not maximize social welfare.

To more closely reach a socially optimal amount of resource conservation, nonprofit delivery of easements should be employed. Also, their funding should be comprised of government grants in addition to individual and business donations. The private benefits under-realized by the public combined with extreme preferences from donor to the nonprofit will evened out each other to more closely reach the socially optimal amount. Government financial support will eliminate high information costs they would incur if they were to provide conservation and a greater level of trust between nonprofits and the government will lower the monitoring costs to the government. The government funding also represents a more equitable distribution of costs (based on received benefits) to current and future generations as well as between private, proximity, and social groups.

In conclusion, the most socially optimal, efficient, and equitable way to conserve land is through easements which are offered to land owners through private incentives. These easements should be offered by environmental nonprofit organizations which are

funded partially by the government. This will achieve a cost-effective, equitable distribution of costs and benefits across generations and groups of individuals affected by land conservation decisions.

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