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Environmental stewardship and community seed banking: An analysis of stewardship in theory and on the ground

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ABSTRACT

This paper explores the conceptual dimension of environmental stewardship from a neo-platonic frame, Patrick Dobel's theology of nature, and Aldo Leopold's philosophy on land ethic. Based on a reading of these works, stewardship as an ethical concept is normative. It seeks rational justifications that would define stewardship in relation to natural resources and the natural world. The paper aims to establish ethics of stewardship and relate it with the traditional approaches to environmental ethics, particularly land ethics. It examines how stewardship may be manifested "on the ground" and in the actual farming communities through Community Seed Banking and other seed conservation initiatives.

KEYWORDS

Environmental philosophy, environmental stewardship, land ethic,
community seed banking, seed conservation

Introduction

This paper aims to provide a conceptual analysis of environmental stewardship through the practice of Community Seed Banking (CSB) and other seed conservation initiatives. It will begin with an exposition of the concept based on its applications in various fields and move towards a more philosophical exploration of its logos and ethos. As the paper aims to provide an understanding of environmental stewardship from a neo-platonic frame, Patrick Dobel's theology of nature and the land ethic philosophy of Aldo Leopold, it also seeks to establish some ethical basis of stewardship and how this ethical basis can have an impact on contemporary approaches in environmental ethics.

Specifically, the paper will explore how environmental stewardship is seen in the practice of the Center-Based Community Seed Bank (CCSB) in Bohol and in other seed conservation initiatives of a similar nature such as the traditional household seed storage method. While the paper is not a full case study of CCSB, it aims to examine how the concept of environmental stewardship may be empirically applied on the ground. The discussion is based on environmental stewardship as practiced through the conservation efforts of the farmers, members of the academe, and non-government organizations (NGOs) who participate in the CSSB or in the traditional household storage initiatives in Bohol. The discussion of the CCSB is based on ethnographic work and interviews with several key informants such as the Director of Research and Development of Bohol Island State University, the institution which spearheads the Plant Genetic Resources (PGR) and CCSB projects in Bohol, Technical Officers of NGOs who are helping the farmers, and farmer participants in Bohol. Based on the conduct of CSB and similar seed conservation efforts, it will be argued that environmental stewardship is being practiced through these initiatives and can be an ethical frame in the formulation of conservation policies and programs.

Environmental Stewardship in Theory

Most of the literature on environmental ethics propose arguments that are rooted in the Christian tradition which shows the fundamental reasons for contemporary environmental problems. A classic work by Lynn White Jr. titled, *The Historical Roots of our Ecological Crisis*, which has been referenced in a number of scholarly works, argues that the roots of our ecological crisis may be seen in the Judeo-Christian belief that humans were given dominion to subdue the earth because they share in God's transcendence of nature (2008). White believes that man will "continue to have a worsening ecologic crisis until we reject the Christian axiom that nature has no reason for existence save to serve man" (20). Patrick Dobel addresses White's argument in his *Judeo-Christian Stewardship Attitude to Nature* and the *Stewards of the Earth's Resources: A Christian Response to Ecology*.¹ In this work, Dobel notes that, "Any ecological ethic which takes into account both God and [the] humanity must begin with the rejection of unbridled human sovereignty over the earth" (2012, 632). He contends that the Judeo-Christian tradition as an "ethics of stewardship", requires careful understanding of the earth and its resources as a finite gift held in trust by God for humanity for all generations (including future generations).

In this paper, I understand stewardship in contrast to dominion and has become a buzzword that refer to any activity that necessitates managing life or property, and being mindful of the interests and rights of others. Since the aim of this paper is to explore environmental stewardship from various philosophical and ethical frames, it begins with a broad inquiry of the concept of stewardship.

Understanding Stewardship

Stewardship is of Old English origin according to the *English Oxford Living Dictionary* derived from the seventeenth century term *steward*, from *stig* (in the sense of a “hall” or “house”) and *weard* or ward, or the action of keeping a look out for danger. As *stig-weard*, it may also be taken to mean “someone that looks after a hall or house and keep it from danger.” Richard Worrell and Michael C. Appleby claim that stewardship essentially implies a metaphor that presupposes that a steward is accountable to a higher authority in managing whatever he/she is entrusted with, and therefore administers it in accordance with authority or whosoever made the trust (2000). According to them, stewardship is “the responsible use (including conservation) of natural resources in a way that takes [a] full and balanced account of the interests of the society, future generations, and other species, as well as of private needs, and accepts significant answerability to society” (275).

Al Gore in his *Earth in the Balance* argues that, “the future of human civilization depends on our stewardship of the environment and just as urgently—stewardship of freedom” (2007, 180). Gore also contends, however, that similar forces, primarily stewardship itself, are at work in destroying both cases of stewardship through greed, self-involvement, and focus on short-term exploitation of resources at the expense of the long-term health of the “system” itself. Here, the use of the term “stewardship” refers to the weakness of a political system which undermines the accountability of the government such as in cases of corruption, which Gore underscores. Stewardship demands accountability and this lack of accountability, according to Gore, have resulted to thousands of cases of environmental destruction (180).

Recently, stewardship has been increasingly applied as a form of management approach on the use of natural resources emphasizing the need to achieve sustainability, and specializing in various areas to recognize the distinctness of the various aspects of the environment. For instance, forest stewardship refers to the management of forests in consideration of sustainable objectives while marine stewardship promotes healthy and sustainable aquatic life. In this regard, land stewardship becomes a call for “the recognition of our collective responsibility to retain the quality and abundance of our land, air, water and biodiversity, and to manage this natural capital in a way that conserves all of its values, be they environmental, economic, social or cultural” (Center for Environmental Stewardship and Conservation, Inc. 2009, 15). This concept has also been adopted in the corporate world in the sense of corporate stewardship, whereby corporations anchor their business philosophies not only on excellent financial results but also on how they conduct their corporate responsibilities in relation to the environment, their employees, and to the local communities that may be subject to their business interests. Hence, companies have sought to

adopt business ethics that protect or uphold the interests or welfare of their constituents such as their shareholders, their customers, suppliers, and workers, in order to ensure adequate wages, ideal health care benefits, tenure, and retirement benefits, among others.

In trying to understand the diverse applications of the concept of stewardship, it is apparent that the concept may also be generally defined as the responsible management of resources, property/ies, administrative functions, conduct of business, among others, as the steward endeavors to consider a larger set of interests, welfare, and responsibilities. The accountability of the steward not only to the owner of the property or resource, as in the case of management or sustainable management, becomes an important aspect of business ethics not only for the company/corporation but also to the wider public.

In this regard, I propose that stewardship as an ethical concept is normative. It seeks for rational justifications that would defend the kind of action it requires in the treatment of natural resources and the natural world. It is therefore important to establish an ethical basis of stewardship and identify how this may be related to traditional approaches in environmental ethics, particularly the land ethic/s.

“Stewardship” in the Neo-Platonic Frame

John Passmore in his *Man’s Responsibility for Nature* notes how the tradition of stewardship sees humans as “stewards” deputized by God to look after his creation and are expected to co-operate with nature in an attempt to perfect it (1974). In this regard, “stewardship” is portrayed as part of the teachings of the neoplatonists, such as Iamblichus. As a school of thought that first came out within the third and seventh centuries, neoplatonism offered a meta-discourse along with reflections on the theories of Plato and Aristotle that brought these theories to a dialogue with literature, myth, and religious practice. Iamblichus was the student of Porphyry whose predecessor was Plotinus known as the founder of Neoplatonism. According to Plato, the soul exists even prior to birth and as such, had communed with ideal forms prior to rebirth. These forms, for Plato, constitute the good, the real, and the permanent. Based on these teachings derived from Plato, Platonists confront the question of why the soul “after it goes back to the body, immerses itself in matter, and enters again the world of sin, and misfortune, and decay” (Passmore 1974, 28). Passmore argues that Iamblichus explains these questions in reference to Plato’s *Phaedrus*, one of Plato’s *Dialogues*, where he discusses love and the art of rhetoric. Along these lines, Plato also puts forth that: “It is everywhere the responsibility of the animate to look after the inanimate. Man is sent to earth to administer earthly things, to care for them in God’s name” (Plato in Passmore 1974, 28). This belief of the neoplatonists is similar to the religious interpretation of stewardship which enjoins

humans to care for God's creation and to perfect it. But for whom? To answer this question, I refer to Passmore citing Iamblichus who quotes a discussion between Socrates and Thrasymachus in *The Republic*. *The Republic* is another of Plato's monumental work which discusses the concept of justice in his vision of the "Ideal Republic." While the Thrasymachus thought that rulers act entirely on their own self-interest, Socrates asserts that a responsible ruler advances the welfare of those he governs. This assertion, according to Passmore, is what Iamblichus had in mind all along when he wrote that man is sent to administer earthly things not for his own delight but for the interests of all creatures to serve the purpose of God. This idea constitutes Iamblichus's neoplatonist concept of stewardship.

Stewardship in Dobel's Theology of Nature

This ecological indictment of Christianity is also derived from Genesis 1:26, which reads: "Let us make man in our image, to our likeness. Let them rule over the fish of the sea, and over the birds of the air, over the cattle and over the wild animals, and over all creeping things that crawl along the ground" (Catholic Pastoral Edition 2012). Furthermore, Genesis 1:28–29 notes: "Be fruitful and increase in number, fill the earth and subdue it; rule over the fish of the sea, the birds of the sky, over every living creature that moves on the ground" (Catholic Pastoral Edition 2012). Based on the interpretation of these biblical passages, transcendence, which man shares with God and establishes man's dominion over nature, allows him to exploit nature without limit for his purpose. Based on this interpretation, the "subjugation" of the earth, and the mandate to subdue "the earth" was taken as a license to take all of the earth's and nature's resources if these are necessary for human survival.

Dobel also cites the Christian view of a temporal life on earth that leads man to exploit nature. Colossians 3:2–5 states: "Set your mind on the things that are above, not on earthly things. For you have died and your life is now hidden with Christ in God...Therefore, put to death what is earthly in your life" (Catholic Pastoral Edition 2012). In extending this Christian view, the material environment may be neglected and exploited. Such is the case that the Greeks have a phrase for it: "Be merry, for tomorrow, you die." This philosophy shows the linear concept of history which starts at birth and ends in death, in contrast with a cyclical view which presupposes the cycle of birth. In the latter, the emphasis would not be on some heavenly ends but on the preservation or conservation of the earthly resources.

Dobel (2012) saw such observation on Christian beliefs as unsound assertions. In his own exegesis of the Bible verses, he asks: "Who owns the earth?" (630)—and provides a Judeo-Christian answer—God. Dobel asks again: "What kind of world did God create?" (630) Dobel confronts his own meanings

when he describes a world created in wisdom so that everything is in harmony and in balance and presents it in the ethical sense according to I Tim 4:4: “God created a world that is good” and this goodness is shared by all creatures (Catholic Pastoral Edition 2012). Furthermore, according to Dobel: “This does not mean that the world is “good” for some purpose only or presupposes that man is utilitarian. The world, in its bounty and multiplicity of life is independently good and ought to be respected as such” (Dobel in Pojman and Pojman 2012, 630). Dobel’s interpretations express the idea that the earth therefore does not belong to humanity but to God, and the resources of the earth are not for man’s sovereign and unlimited use, which is how others such as White have interpreted in the idea of “dominion” or “subjugation” of nature as mandated in Genesis. In this regard, the earth is entrusted to man in a covenant as seen in Psalm 119:96 which states that there is a “limit upon all perfection” (Catholic Pastoral Edition 2012). That the world must have been created with all its bounty and that there is balance of nature, but the possibility of exhaustion and desolation is always there. Dobel explains that the recognition of the limits of reality implies that “we must discover and respect the limits upon ourselves, our use of resources, our consumption, our treatment of others and the environment with its delicate ecosystems” (Dobel in Pojman and Pojman 2012, 631).

Based on these elaborations, God’s ownership of the earth, human trusteeship, and the limits of creation, the ideas of stewardship may be derived from Dobel. From Dobel’s interpretation may be gleaned his call for humility to care for the use and improvement of the earth as it is entrusted to man. The owner’s dictates and design of resources in terms of their limits must be recognized and respected. The idea and “mandate” of dominion is not to be taken to mean that man can be a despot who controls and spoils the earth simply for his purpose because it is clear that the earth does not belong to humanity, and neither is it limitless. Hence, the ethics of stewardship makes man stewards with “the obligation not to exhaust non renewable resources, the imperative to provide accessible replacements, the necessity to improve our heritage modestly and carefully, the greater responsibility of the advantaged to improve that which exists and to share, and the obligation to refrain from excessive consumption and waste” (632). These imperatives should govern environmental stewardship.

Stewardship in Leopold’s Land Ethic Philosophy

Aldo Leopold’s philosophy of “Land Ethic” constitutes the last chapter of his book, *A Sand County Almanac* (2001). This work has received varying reactions particularly among contemporary academic philosophers. Seen as a retrogression to the kind of morality of “primitive peoples” and land ethics’ unsettling practical implications, or the view that it could lead to environmental fascism has led some philosophers to ignore it. On the contrary, J. Baird Callicott, considered

one of the leading contemporary exponent and philosopher of Leopold's work, notes how land ethic poses not only a serious intellectual and moral challenge to environmental ethics but may also provide secular, rational, and foundational principles in support of the ethics of stewardship (1989).

The Land Ethic Philosophy, which was developed in the late 1940s, introduced the possibility of expanding moral consideration or the extension of ethics. Leopold conceived of a wider moral community that includes not only man but also his total environment, and the animals and plants that grow on it. It is within this frame that environmental/ecological ethics which is the "limitation on freedom of action in the struggle for existence" developed and became an important turning point in establishing the foundational principle of stewardship (Leopold 2001, 168). Philosophically, Leopold claims that "the thing [ethic] has its origin in the tendency of interdependent individuals or groups to evolve modes of cooperation. The ecologists call this symbiosis. Politics and economics are advanced symbioses in which the original free-for-all competition has been replaced, in part, by co-operative mechanisms with an ethical content" (168).

From these ideas, we can ask the question: How did ethics or the limitation on freedom of action and tendency to evolve modes of cooperation originate? What is the foundational principle behind the ethical precept? One may turn to theology and argue that God imposed this moral precept on man. In Western philosophy, according to Callicott, the origin of ethics is rooted in reason for reason drives man to take part in a social contract for the common good. Callicott argues that reason is central in the conception of the "social contract", from Protagoras, to Thomas Hobbes and John Rawls and the spring of virtue for Plato and Aristotle, as well as Immanuel Kant's basis for the categorical imperatives (1989). The virtue ethics of Aristotle emphasize the telos of man as rational beings who must live their lives in accordance with reason. The categorical imperatives of Kant, from which all duties are derived are *a priori* and therefore conceived through reason recognizing no contradiction. "In short, the weight of Western philosophy inclines to the view that we are moral beings because we are rational beings" (Callicott 1989, 78). According to Leopold, the ongoing sophistication of reason and the progressive illumination it sheds upon the good and the right explain the ethical sequence, the historical growth and development of morality (2001, 78).

It is therefore by reason that this call is being made to extend ethics from being a relation between individuals, to a relationship between the individual and his society, and to what Leopold terms as the third stage in the ethical sequence—an ethic that deals with man's relation to "land". Leopold (2001) argues that, "all ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics also prompt him to

cooperate (perhaps in order that there may be a place to compete for)” (2000, 171). This imperative to cooperate gives rise to another important assumption of land ethic, that man are members of a community of interdependent parts, they are not conquerors of the land but plain members and citizens of it. Their membership to the community requires respect of their fellow members and their community. Why is this the case?

Leopold’s concept of community in his philosophy of Land Ethic is crucial to the idea of ethics since it emphasizes the rightness of action insofar as it promotes the integrity, stability, and beauty of the whole land community. It is noteworthy, however, that for Leopold, “community” comprises not just human community but also the “land”. The concept of land requires a full understanding of the thermodynamic flow model of the environment with all the life support processes, food webs, food chains, flow of energy across tropic levels or what Leopold refers to as the land pyramid. “Land,” therefore, “is not merely the soil; it is a fountain of energy flowing through a circuit of soils, plants, and animals. Food chains are the living channels which conduct energy upward; death and decay return to the soil. The circuit is not closed...but it is a sustained circuit, like a slowly augmented revolving fund of life” (181). It is this understanding of the environment that constitutes Leopold’s cardinal precept of the land ethic. The complex interdependence of the land’s elements and its functional dynamics are the rationale for a holistic consideration of all the parts. Leopold’s model justifies the shift in emphasis of moral consideration from individual members of the community to the whole land and why membership to the community requires respect for all. In this regard, this philosophy demands the recognition of the ecological fact that the land and our environment is a complex interdependent community that is also a moral fact.

In his 1989 essay, *Farmer as a Conservationist*, Leopold also emphasizes that “conservation is a state of harmony between men and land. When land does well for its owner, and the owner does well by his land; when both end up better by reason of their partnership, we have conservation. When one grows poorer, we do not” (1999, 161). He further argues that no conservation effort will be successful unless we stop thinking of land-use simply on economic grounds. “A system of conservation based solely on economic self-interest is hopelessly lopsided. It tends to ignore, and thus eventually eliminate many elements in the land community that lack commercial value, but that are (as far as we know) essential to its healthy functioning” (179). From Leopold’s contentions, we can derive that decent land use requires an examination not only of what should be ethically and aesthetically right, but also what is economically expedient.

Land Ethic Philosophy and the ethics of stewardship

From Leopold's philosophy of Land Ethic, which was used to formulate an understanding of "environmental stewardship" that forms the foundation of this study, there are three important elements in stewardship. First, stewardship should be taken as the responsible management of resources, which forms the core of the moral consideration of Leopold's land ethic philosophy. As such, there is a need to adopt and think about extending the scope of our moral consideration to include the rest of the elements that make up our environment as we all share in the cycle of energy. This philosophy is an ecological fact and should be emphasized, understood, and upheld. Second, a steward becomes a metaphor for a moral agent who manages the environment even if he does not own it. For Leopold, man is only one part of an integrated environmental system. Thus, men are not conquerors of the land, a role that Leopold considers is self-defeating. A conqueror should understand how the community works, what and who are of value, and which are not. On the contrary, humans, given the complexity of the land, know neither. As such, they cannot claim to be masters or conquerors of the land community, in the same manner that a steward cannot claim ownership of that which he manages only. In other words, Leopold proposes a view of nature where man is not the dominant species whose success on the planet depends on how well he can control the earth. Instead, man is dependent on how well he co-exists with the rest of the elements in the ecosystem.

Third, a steward is accountable not only to the owner of the resources. This accountability is anchored on the philosophy of land ethic which recognizes a holistic view of the environment and all that it encompasses. In this philosophy, members of the land community are the stakeholders. Therefore, a right action by a moral agent should only consider acts which are for the preservation of the integrity, stability, and beauty of the biotic community.

To a certain extent, the practical application of the land ethic philosophy may lead to environmental fascism where the extermination of 70 per cent of humankind, for example, is justifiable as it is necessary to maintain the balance or integrity of the whole community. Callicott, in defense of the land ethic philosophy disagrees and contends that such an action is not ethical because the very act will exclude man who share membership in the community with others. He argues further that in expanding the scope of moral consideration, humans who are at the core of the community cannot be excluded, since they remain members whose needs must also be considered; the community simply accommodates other members as it expands. Hence, what is necessary is for man to perform sacrifices that consider the interests of the other members of the community in the moral calculus, to maintain the balance, integrity, and beauty of the land. In the same light, the stewardship tradition also calls for reasonable

trade-offs among members of the community should they be necessary for the sustainable use of the earth's resources for the present and future generations. The steward has to recognize the growing scope of his accountability because his actions affect not only himself or his fellow man but also the rest of the community.

The foregoing discussions on the logos and ethos of stewardship aim to provide some rational justification on the observed tenets of stewardship. The ethical discussion makes stewardship a moral normative subject instead of simply a descriptive subject dealing with the ethical use of the earth and earth's resources. If stewardship is to be an ethical precept on how to treat the environment then it also has to be understood as a moral normative subject.

Stewardship on the Ground: Environmental Stewardship in Center-Based Community Seed Banking and Seed Conservation Initiatives

Seedbanking plays a very important role in plant genetic conservation. In a global review conducted by the Botanical Gardens Conservation International (BGCI), the main objectives for banking and collecting seeds are generally the same. "Most collect and bank seed for conservation and as a backup or to replace living collections. Reintroduction and exchange (*index seminum*) are also important. Several institutions collect and bank seed for research purposes" (O'Donnell and Sharrock 2015, 7). According to BGCI, however, seed banking mostly focus on agricultural crops. In their survey on botanical gardens which collect and bank seed, endemic and threatened species which are not trees are the ones being prioritized, while there is less emphasis on conserving trees and those plants which are economically important (O'Donnell and Sharrock 2015).

The Svalbard Global Seed Vault dug deep below the permafrost into a solid rock in Norway, holds almost half a million diverse specimens of the world's seeds and have duplicate samples of seeds kept in gene banks worldwide (Chopra 2010). "Around the world, more than 1500 seed banks, large and small, function as backup systems in case of environmental catastrophe. Should an entire crop be wiped out, planters could use seed reserves to start again"(1). Surinder Chopra notes that the global decrease in biodiversity at an unprecedented rate could have far reaching consequences, especially for the poorest communities which are also the most particularly vulnerable to agricultural calamities. In light of these communities, seed conservation becomes an imperative global project for plant genetic diversity. Seed conservation efforts, however, seem to be more efficient if done on the grassroots level and oriented towards community tradition and local knowledge, which is the current program of the global network for biodiversity conservation.

Seed banks managed and maintained by communities are usually referred to as Community Seed Banks or CSBs. CSBs are defined as "collections of seeds

that are maintained and administered by communities themselves, either in large quantity to ensure the availability of planting materials, or in small samples to ensure that genetic material is available when needed for regeneration or breeding purposes” (Utviklingsfondet 2011). Ronnie Vernooy, Pitambar Shrestha, and Bhuwon Sthapit, in their *Community Seedbanks, Origins, Evolutions and Prospects*, claim that “community level seed-saving initiatives have been around for 30 years (2015). They have been designed and implemented to conserve, restore, revitalize, strengthen and improve local seed systems, especially but not solely, focused on local varieties” (1). These initiatives, based on the three authors’ survey, were labelled as community gene bank, farmer seed house, seed hut, seed wealth center, seed-savers group, community seed reserve, seed library, and community seed bank. By these initiatives, farmers and local communities were able to gain more control of their seeds and facilitate dynamic forms of cooperation among each other and with concerned groups who are involved in the conservation and sustainable use of agricultural biodiversity.

It is interesting to note, from the observation of Vernooy et al., (2015) that most of the information on community seed banks is empirical or taken from the narratives or experiences of the farmers themselves, or read in the grey literature or briefs of the non-governmental organizations (NGOs) that assist farmers in these efforts.

The emergence of CSBs in the Philippines in a position paper by Rice Watch Network (RWAN) titled, “Community Seed Banks: Agricultural Biodiversity in Farmers’ Hands”, shows that as early as the 1980’s, there were already a number of civil society organizations and farmers’ organizations who are working on the development of seed banks (n.d.). NGOs such as Sibol ng Agham at Teknolohiya (SIBAT), Magsasaka at Syentipiko para sa Pag-unlad ng Agrikultura (MASIPAG), and Southeast Asia Regional Initiatives for Community Empowerment (SEARICE) are among those who championed community seed banking as part of their respective programs. According to RWAN, “in the Philippines, CSBs are promoted as important components of broader programs or initiatives in the conservation and development of agricultural biodiversity such as sustainable agriculture” (3). Community seed banking is considered by these organizations as a key in regaining access and control by farmers over their seeds which are considered to be at the core of farm production. Thus, CSBs are part of the advocacies of NGOs towards sustainable agriculture and farmers’ control over their land and resources.

Marina A. Labonite of Bohol Island State University (BISU) and Center-based Community Seed Bank (CCSB) narrates that in 1999, three barangays in Bilar, Bohol namely Campagao, Cansumbol, and Zamora had initiated the establishment of CSBs in Bohol, but these were limited to organic rice only.² According to Labonite, the seed banks were all managed by the organic rice

farmers organizations in these barangays, such as the Campagao Farmers Producers Researchers Association, Cansumbol Organic Farmers Association, and Zamora Organic Farmers Researchers Association. These three organizations later on merged to form the Farmers Consultative Council (FCC). These organizations received financial and technical assistance from the SEARICE and the Central Visayas State College of Agriculture, Forestry and Technology - Main Campus (now Bohol Island State University), but the farmers' organizations were unable to sustain their daily activities for lack of time to collect and store seeds. In 2001, BISU-Bilar took charge of the operation of the seed banking project, after it had established its own collection of organic rice with their own accessions.³ Since then, Labonite stated that the CCSB in BISU-Bilar has provided the back supply of seeds of organic rice accessions comprising of traditional farmers' selections, International Rice Research Institute (IRRI), Philippine Seedboard (PSB), and the National Seed Industry Council (NSIC) varieties, as well as exotic rice varieties which they get from seed exchanges during conferences.

The CCSB initiative in Bohol involve the five basic technical requirements of seed banking, namely: collection, registration, regeneration, characterization, and storage. More specifically, the CCSB's activities include the following: acquisition of germplasm; seed drying and storage; seed health and viability monitoring; regeneration and multiplication; characterization; evaluation; and ensuring sustainability of seeds.

While there are currently no barangays or municipalities in Bohol that have independent Plant Genetic Resources (PGR) Conservation units, farmers claim to have conserved seeds of more than twenty accessions with some selections or breeding lines, which they have donated to CCSB in BISU-Bilar. They have also kept the seeds for planting for the next cropping season following the traditional seed keeping method, similar to keeping their harvest reserved for consumption, which is to properly clean the harvest, dry it, and keep it free from pests. The CCSB's general germplasm or genetic material collection system involves retrieval of endangered varieties as well as traditional varieties from farmers and farmers' organizations, including donation of selections and breeding lines by farmers-breeders with the help of SEARICE, Seedbank In-Charge, FCC members, Farmers' Field School (FFS) participants, and BISU students. Acquisition of seeds, particularly the exotic varieties, is also made possible during local and international seed exchanges that farmers and the CCSB participate in. Base collections, or those that farmers keep for long term conservation, are placed in cold storage while active collections or those for dispersal to end users are kept in ordinary room temperature for short-term conservation. This aspect of seed collection highlights the role of farmers whose commitment to CSB is indispensable. Farmers engage in Participatory Plant Breeding (PPB), which is an on-farm crop improvement hybridization or cross-breeding process utilizing

indigenous and introduced crop varieties. With the help of NGOs and the CCSB, farming communities are empowered to learn and participate in on-farm breeding. Farmers also practice what they call On-farm Testing and Trial for the identification of the most suitable varieties of seeds or those which are more agro-ecologically attuned to their farms. The farmers related that to undertake this, they plant around five varieties of rice and compare each one in terms of crop characteristics, such as stand and vigor, tillering ability or the number of tillers, panicle length, number of grains per panicle, and yield. These comparisons are commonly done through ocular observation, practical comparison, and counting of grains in the panicles and measuring panicle length using the span of the hand from the tip of the thumb to the tip of the middle finger. Farmers perform this comparison throughout the entire cropping season. Crucial to its accomplishments are the farmers' local knowledge of the dynamics of their own farm, in consideration of factors that affect the growth and development of their crops such as the weather.

Farmers engage in such undertakings in support of the CCSB, despite limited farm space and the demands on their time. This undertaking on the part of the farmers become significant because the resources they produce are voluntarily given to the center. Some of the problems of the on-farm conservation of genetic resources in CCSB Bohol include limited space for the other promising seeds of indigenous crops because family landholdings are smaller than those in the past. Not having enough funds to undertake the continuous regeneration of the seeds, as well as the characterization activities (i.e., On-Farm Seed Testing and Trial) which, according to Labonite, should be done continuously to expose the accessions to the daily changes of the climate/weather conditions in the area so that the seeds become more resilient to the changing weather conditions, add to the problems besetting seed conservation (Labonite 2015).

It is also noteworthy that farmers practice seed exchange because some of them prefer a rice variety with better yield, based on the on-farm seed testing/trial. From the stories of farmers, we also know how they would sometimes purposely exchange seeds for varietal rotation because this practice reduce pest and disease management in their farms. In doing so, the varieties rotated by the farmers are conserved. There are also occasions when traditional exchanges of the seed, particularly the best performing rice varieties, were done due to lack of funds or seed subsidy. In such cases, farmers simply exchange their seeds with those seeds preserved by the neighboring farmers. They hold a Farmers' Field Day usually before harvest time, which allows farmers to go around the field trial holding forms with parameters for preferred traits/characteristics of seeds, which they then score. This score card now serves as the basis for selecting their preferred varieties. During field day, farmers gather rice seeds that are suited to their own selection criteria, then afterwards plant and screen their yield potential

in their own farm. The selected best materials are then referred to as the Farmers' Selection. The CCSB makes a list of the farmers' selections and the seeds are eventually distributed to interested farmers for planting in the succeeding seasons, thus facilitating the eventual conservation of seeds that are being shared. "Maybe nature allows this to happen so that indigenous practices and knowledge will not be eroded or so that the PGR will be preserved," Labonite says. She even adds that the other big support that the CCSB gets from the farmers aside from their donations of seeds is their interest to use the accessions which were proven to be high yielding so that these accessions will not be lost (Labonite 2015).

These farmers were then asked who they think owns the seeds that they so carefully protect, improve, and conserve. One group said that whosoever produces the seed is the rightful owner. Others said that of course it is God who is the source of everything. Farmers who were exposed to Seed Banking and PGR Conservation through conferences with the technical officers of the NGOs, proudly said that the seeds are a public domain. Nobody owns the seed; they are for everyone to nurture, protect, and conserve for everyone's rightful use for survival and sustenance. I probed some more on whether they agreed that losing the seeds may also mean losing their heritage as the seeds are also the purveyors of local knowledge, and their narrative was interesting. The farmers narrated that during drought season they remember the drought-tolerant seed varieties, which their grandparents have been using in the past. These seeds, which are referred to as *Lubang Puna* or Red Lubang and *Panganabaw* have already been lost because of the new and high yielding varieties that farmers replaced the traditional seeds with. As they continued their narrative, the farmers admitted that they feel sorry that the seeds were not preserved as their yield could have survived the drought that Bohol was experiencing that time. If only they knew, 'Nong Radix⁴ said (Calamba 2016). At the same time, the farmers brought up the issue of purple crops (i.e., rice, sugarcane, sesame, ginger, etc.), and shared that traditionally almost every one of them had to plant purple crops because of the latter's special uses, particularly as herbal medicine for certain ailments or as remedy for those who have been poisoned by undetermined causes. The use of pharmaceutical drugs, however, became popular, so the farmers stopped planting these crops. In the last couple of years, however, the purple rice became popular again because its purple pigment (anthocyanin) has been proven to have effective antioxidant as well as anti-carcinogenic properties. In this regard, the farmers have belatedly realized that had they been made aware of the properties of the purple crops, they would have cultivated them and made them available to different parts of the Philippines.

Eventually, when the farmers were asked why they view seed banking and conservation important enough for them to take part in the efforts of seed conservation, some farmers replied that that they did it for their families.

Conserving the seeds on their own has ensured a steady supply of seeds at least within the household level for the next cropping season, but they realized that those who have attended the FFS on PGR Conservation, such as ‘Nong Cen, have demonstrated that community participation is for everyone—the breeders and the future generation—and not only for themselves (Salces 2016).⁵ Jean Yasol-Lugasip, then Technical Officer of SEARICE who directly worked with the farmers, shared that the exposure of these farmers to seed conservation enabled them to fully understand the valuable contribution of farmers in the conservation of seeds, even if “for them it is just doing what they need to do, it is something organic, for they know their lives depend on their farms and crops,” Yasol-Lugasip noted (2016).⁶ The CCSB provides access to organic rice seeds based on the farmers’ choices, selected from the available seeds during the PPB activities that are then evaluated on Farmers’ Field Day. This process allows strategic seed reserves for the drought years, gives access to good quality seeds, and most of all, ensures farmers’ seed security at the community level.

Stewardship in the Experience of CCSB in Bohol and in other Seed Conservation Initiatives

The experience of the CCSB in Bohol is not necessarily unique compared with the experiences of CSBs in other parts of the Philippines, or even with their international counterparts. There may also be similarities with the traditional household method of storing seed for immediate utilization in the succeeding planting season. In fact, I would like to argue that while it appears that the reference to CSBs and how it is referred to by other names such as household seed banking, CSBs on their own are imbued with important semiotic representations. CSBs and other seed conservation initiatives also share some fundamental elements vital to the discourse of “environmental stewardship”. In this regard, I would like to establish that the stewardship tradition in general can be an ethical precept behind the operations and ends of the CCSB initiative in Bohol, the general tradition of seed banking, or plain seed storage, as it resembles what I have observed and learned from the farmers, NGO, and the head of the CCSB in Bohol.

First, the tradition of environmental stewardship claims responsible management of resources. One dominant element in the emergence of CSBs in various modalities is the objective to preserve, develop, and improve seeds. CSBs have facilitated the storage of diverse varieties of seeds ranging from traditional and farmer-developed varieties to modern and exotic seeds from other countries. In the case of the CCSB in Bohol, it was established primarily to preserve the traditional organic varieties of rice and as such, resulted from the efforts of an organic rice farmers’ organization. Thus, with the in-situ or on-farm seed

conservation through PPB, On-Farm Field Trial, and Farmers' Selection, we are able to glean responsible management of on-farm biodiversity. These in-situ techniques reflect efforts that promote conservation and improvement of crop diversity, ensuring or at least addressing the impact of changing weather conditions or long-term climate change. In fact, global efforts at conserving seeds (albeit confronting various reactions from different sectors) are really geared towards the proper management of this finite resource. RWAN argues:

Community seed bank is not an end in itself, but is a means towards broader goals including environment and biodiversity objectives. CSBs should be designed to support on-farm seed conservation and development efforts by farmers, especially women who are primarily responsible for the management of on-farm diversity. CSBs should promote diversity in crops and varieties as a foundation for farmers' adaptation to the adverse impacts of climate change. Greater diversity on-farm provides more assurance for farmers to select and breed locally adapted crops and varieties (n.d., 5).

Since the CCSB-BISU dominantly stores collections of local, traditional, developed, and farmers' selection varieties which were acquired, bred, and selected by their respective communities, it aids in the promotion and use of seeds that are more agro-ecologically adaptive to their locality. This quality of adaptiveness ensures that the seeds can be made more available and accessible to the local community. It is noteworthy that there is also household seed-keeping, whereby farming families have their own selection and collection of seeds as support mechanism to community seed banks, which makes resource management even more efficient.

Environmental stewardship as the responsible management of resources was earlier justified as an imperative to expand the scope of ethical consideration. Part of being an environmental steward is making a conscious effort to be informed of the interconnections of the processes and dynamics of nature. The farmer-stewards of the CCSBs in Bohol who participate in the Farmers' Field School, PPB, Participatory Farm Trials, Farmers' Selection, etc. have become more informed on the dynamics of nature and have acquired a technical knowledge of the interconnection of nature's processes. The years that farmers have spent on their farms and in rice cultivation must have also provided them with a deeper knowledge of rice farming even before they joined the field schools. The CCSB and the NGO (SEARICE in this case) have thus tapped their local knowledge in determining which varieties are ideal for cross-breeding or which traits should be preferred based on the farmers' experience, so that a more agro-ecologically attuned variety can be produced.

Second, the metaphor of a steward points to a moral agent who does not own the resources which he manages. This also brings out two ideas of stewardship: first, the idea that a steward is under “obligation not to exhaust nonrenewable resources, the imperative to provide accessible replacements, the necessity to improve our heritage modestly and carefully... not only for the present but in consideration of the future generation” (Dobel in Pojman and Pojman 2012, 632) and second, the “obligation of the animate to look after the inanimate, care and administer earthly things for the delight of all creatures in the service of God” (Phaedrus in Passmore 1974, 28). In carefully studying the general orientation of CSBs on seed conservation, it is easy to identify that it is derived from the basic principle of the International Undertaking on Plant Genetic Resources,⁷ which states that, “plant genetic resources should be considered as a common heritage of mankind and be available without restrictions for plant breeding, scientific and development purposes to all countries and institutions concerned.” In this regard, it is a given that seeds/plant genetic materials are a common heritage, and this category of ownership should ensure open access to seeds/plant genetic materials without anyone claiming ownership.

The CCSB farmers had different answers when asked about ownership of the seeds. While some said God is the sole owner, a more secular answer points to the one who produces, referring to those who may have done the breeding or development of new varieties. In the case of the first answer that it is God who owns the seed, it may be inferred that the farmers recognize that the seeds they were trying to protect is not theirs. If the purpose of protecting the seeds is to ensure a steady supply of food for the family (which some of them claimed), while recognizing that the seed is not theirs, it may be understood that the farmers were protecting the seeds as a resource that benefits their family even as they understand that these seeds belong first and foremost to God. In this way, they now become good stewards who are taking care of a resource that was made for their careful use but one that should not be depleted or exhausted and replaced if needed. Why can they not deplete the seeds? Simply because these are also intended to benefit the next generation. The CCSBs role to protect the farmers’ rice accessions, or the role of any seed or PGR Conservation in general, which is to preserve, improve, and protect the seeds not only for oneself but for the rest of humanity therefore, is a response to the call of stewardship. This is why seed-sharing constitutes an important element in the practice of CCSB in Bohol, which I think is also true of all CSBs as well as the traditional household level of seed storage. This is also the rationale of community seed banks which protect their seeds from patenting which limits the rights of individuals or corporations to exclude others from using the resource.

It cannot be emphasized enough that CSBs, which store the local seed system of the community, are also the living storage of indigenous and local knowledge.

Farmers have realized this based on their narrative on the Lubang Puwa or purple crops. The preservation of the seeds, in this regard, became important for the community in maintaining a common heritage that connects them to the previous as well as the future generations. This is the essence of the intangible resources which the CSB steward or any seed conservation steward has to reckon with.

Third, the steward is accountable to the owner and all stakeholders of the resources. This accounts for the view of stewardship and its broadening set of interests, welfare, and responsibilities beyond the owner and himself. This also includes the accountability of the steward to a wider public including future generations and other species. Stewardship, in this regard, harkens back to the philosophy of land ethic which holds that “the action is good if it promotes the integrity, stability, beauty of the whole community” (Leopold 2001, 189). When it was established, the CCSB in Bohol was built on a strong community foundation based on the felt need of the organic rice farmers to protect their rice from new varieties being introduced into the province. There was a clear concurrence among the farmers’ groups to protect their local seeds, which eventually gained the support of a local NGO, such as SEARICE; an agricultural academic institution such as BISU; and the Bohol LGU through its Provincial Agricultural Office. This collaboration of different stakeholders and interest groups has somehow guaranteed that the main users and beneficiaries of the CCSB will be the community itself. Since the farmers are involved in the CCSB’s operation, particularly in the collection and regeneration of seeds, the farmers’ community now becomes accountable to everyone. In this sense, farmers such as Nong Cen and Nong Radix realize that they all have the right to save, use, and exchange farm-saved seeds. Stewardship, in this sense, expects that the ends and benefits of their CCSB will include free and open access to seeds which are locally-adapted, as well as improved crop varieties that may redound to improving the social well-being of the local communities, food security, and increased farm income for all the stakeholders.

Considering the various efforts along the lines of the land ethic, it is not hard to realize how the CCSB or any other similar form of seed or PGR conservation is aimed at promoting the integrity, beauty, stability, and diversity of the whole biotic community not only for a localized community but also for the global population.

Conclusion

Stewardship is a normative subject that seeks ethical justifications using varied philosophical and ethical frames, including the land ethic philosophy. The tradition of stewardship justified in the frame of the land ethic philosophy showed vital elements: stewardship and the responsible management of resources; the steward

as a moral agent who does not necessarily own the resources he manages; and the steward's accountability not only to the owner of the resources but to all stakeholders. This concept of environmental stewardship, as I have argued, is manifested in the operation of the CCSB in Bohol that operationalizes these vital elements which may not be exactly unique to Bohol because other similar seed conservation initiatives may have the same qualities. In this regard, this conceptualization and application of stewardship may be applied and adapted as an ethical frame in the implementation of policies and programs on environmental conservation.

Notes

1. Article is reprinted in Pojman and Pojman (2012) and first appeared in *The Christian Century: Focus on the Stewardship of Earth*, 12 October 1977 as "Stewards of the Earth's Resources: A Christian Response to Ecology."
2. Marina A. Labonite, Professor and Director of Research and Development of BISU and Officer-in-Charge of Center-based Community Seed Bank in BISU-Bilar, in discussion with the author on 1 April 2015.
3. Glossary of the Food and Agriculture Organization of the United Nations define 'accession' as a distinct, uniquely identifiable sample of seeds representing a cultivar, breeding line or a population, which is maintained in storage for conservation and use. Each seed accession is issued an Accession Number which is a unique identifier when it is entered into a gene bank.
4. 'Nong Radix or Geraldo Calamba, a farmer from Cansubol, Bohol and a longtime member of the FCC which co-established the CCSB at BISU, Bohol, in discussion with the author on 1 April 2016.
5. 'Nong Cen or Crisenio Salces, a farmer from Campagao, Bohol and a longtime member of the FCC which co-established the CCSB at BISU, Bohol, in discussion with the author on 1 April 2016.
6. Jean Yasol-Lugasip, in discussion with the author on 7 April 2016.
7. Food and Agriculture Organization of the United Nations, Report of the Conference of FAO 22nd Session, (Rome, 1983). Available from <http://www.fao.org/3/a-x5563e/index.html> (accessed 12 April 2016).

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