

Integral Ecology = Environmental Ecology + Divine Ecology

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I. Introduction: Pope Francis' new encyclical and environmental concern:

In a bid to unite and better motivate all men and women of goodwill- to collaborate and do more in protecting the environment and in fighting climate change - whose adverse effects (sea level rise, extreme weather events, biodiversity loss, droughts, floods, etc) constitute a great threat to the habitability of planet Earth and to human life , Pope Francis wrote a beautiful encyclical, entitled Laudato Si, published last June 18, 2015. The title means “praise to the Lord” and is derived from a great hymn of praise composed by St. Francis of Assisi that stresses being in harmony with God and all of his creation- non-living and living things alike including all other human beings . Through this letter which has gained widespread acclaim from various groups and individuals – including scientific , environmental and religious associations–and which is expected to influence the proceedings and outcomes of two forthcoming international conferences on environment and climate change in the United Nations Organization, New York , September 2015 and in Paris , November 2015, Pope Francis praises God for the great beauty, goodness and gift of His creation, planet Earth , which serves as a common home for us all and constitutes our common life- support system. He then calls our attention to the currently deteriorating state of this environment due to our uncaring treatment of it, our unsustainable ways of production and consumption-we are consuming natural resources much faster than they can regenerate themselves and we are producing products that end up being thrown away in some parts of the world because they are excessive and these use up natural resources , our having forgotten God’s original plan for us and the dangers such degradation pose to human life most specially the poor who have very little means to protect themselves from its adverse effects. To reverse the situation, the encyclical spells out a broad range of measures and initiatives that include the following :

1. The promotion of peace that would end wars and terrorism (both of which are extremely destructive to life and to the environment) through dialogues and mutual understanding ;
2. prevention of social conflicts by fostering social justice (eg, generating more jobs that would eradicate extreme poverty, caring for the environment to safeguard the jobs of those who depend on the fruitfulness of the earth for their livelihood, recognizing the equality of all men and women, etc.) , exercising mutual respect for each other’s national sovereignty and observing the tremendous dignity of every human life as a child of God in all its stages
3. changing our lifestyles to a more sober and temperate but more satisfying one- focusing on the essentials- ie, what we really need to live as human beings -, and not just on what we want ; and improving our ways of

producing things so that we don't imprudently consume so many resources and deplete them with our production processes (eg, cutting down a forest to give way to agricultural production or establishing a condominium, etc and not doing anything to make up for its removal in terms of ecological balance and biodiversity conservation) leaving nothing for future generations

4. the establishment of stable authoritative bodies at local and international levels that can formulate and enforce rules, regulations, and policies on what can be considered as mutually acceptable conduct

5. Changing our mindsets and outlook in life to help us better live in harmony with all of creation in accordance with God's original plan so that each of us can really help to take care of the environment -with the help of a continuing education on integral ecology.

Pope Francis concludes his encyclical with two elegant prayers:

1) "A Prayer for Planet Earth" which recognizes God's presence in the whole universe , even in the smallest creatures, and asks God for encouragement for our struggle for justice, love and peace that we may protect the world and sow harmony and beauty instead of depletion, pollution, degradation, and destruction.

2)" A Christian prayer in Union with Creation" praises the Blessed Trinity for the creation, redemption, sanctification of the world and prays for the grace for all human beings to see that our place in the world is to be channels of God's love for all the creatures of this earth everyone of whom God remembers and bears in mind at all times.

The discussion that follows takes up the Pope's suggestion for the need for a new outlook in life and adopt a more ecologically attuned lifestyle with the help of an integral ecological education and spirituality for everyone - specially the young to facilitate the fight for the sustainability of planet Earth. Knowledge of this kind of ecology should not only give us scientific information about the environment and methods of modifying human behavior so that human beings can interact more positively instead of negatively with the environment and the effects of our actions on it but must result in the development of practical habits and virtues that are translated into practical care for all of God's creation in one's daily actions and decisions.

II. Integral Ecology = Environmental Ecology + Divine Ecology

Ecology is the study of the interactions or relationships between living things and their environment (composed of living and nonliving components) .There are various kinds of ecology depending on what part, factor, or component of the environment is being focused on . Hence, there is microorganism ecology, plant ecology, animal ecology, human ecology, fire ecology, ocean ecology, soil ecology, restoration ecology, human ecology, mathematical ecology, etc. There is also ecological engineering, ecological architecture, ecological art, etc. The term is at times even extended to elementary particle ecology where no life is involved but just matter at the every basic level, like electrons, quarks, etc interacting with each other through an exchange of force- carrier particles called gravitons, photons, gluons, etc .

An integral ecology is based on a fuller or more realistic view of the environment: it recognizes the fact that it is made up of material and non-material or spiritual elements that interact with each other and that a spiritual living God made it . Material beings interact via an exchange or flow of materials (matter) and

energy . Spiritual beings since they have intellects and free will interact via an exchange or flow of truth and love ie, in the language of elementary particle physics , an exchange of the love and truth particles . These interactions help sustain life and give dynamism, structure, and stability to the universe, bind the various elements to each other and give rise to relationships of interdependence and interconnectedness –ie, that the existence and wellbeing of one will depend on or is affected by the others’ existence and wellbeing.

The hierarchy of beings (an arrangement of things found in the world in the order of increasing capabilities or perfections; arranged in staircase fashion; probably originated by Aristotle but modified and improved with the passage of time) facilitates our review of the various elements or components of the environment and somehow shows us their dependence on one another:

God-Creator of the environment

Angels-pure created spirits having superior intellects and willpower relative to humans

Human Beings- peak of visible creation; stewards of creation

Animals

Plants

Microorganisms

Non-living things (rocks, water, gases, sunlight, stars,dust, etc)

This hierarchy is useful because 1) it gives us a basic global view or structure of reality at a glance, although, as some one commented, “ reality is far richer than what the hierarchy shows because there are also beings that straddle the categories” 2) it shows us the order of increasing capabilities of its various components 3) it shows us God at the pinnacle who is the ultimate creator, maintainer, and developer of the environment and is present at all times –hence is a powerful visual aid or reminder for living awareness of God’s presence at all times and in all things in the world (God is omnipresent , omniscient, omnipotent !) 4) we see human beings as being at the peak of visible creation and hence, their responsibility of being stewards or caretakers of creation is very understandable 5) we also see human beings as forming the microcosm of the universe because man/he is made of matter and spirit of which the universe is made of . We infer that the various scientific disciplines arise from the particular focus that each one takes in relation to the hierarchy. Physical scientists (like physicists, chemists, geologists, meteorologists , climatologists , etc) are those who focus on the study of material non-living things (although there is biophysics, biochemistry, etc which involve the application of physical and chemical principles to living matter) while those who study material living things are called biologists, microbiologists, botanists, zoologists, ichthyologists, ornithologists, entomologists, etc. On the other hand, those who study human beings and their social behavior are called anthropological and social scientists, psychologists, economists, etc . Finally, those who study God and the ultimate causes of reality are called theologians and philosophers, metaphysicians .

Clearly, since the environment is diverse and complex due to the multiplicity and variety of its components and their interactions ,we need a multidisciplinary approach to be able to understand it well. Hence,

environmental science is a multidisciplinary science and is anchored on several important principles: a) every component of the environment is just a part of a bigger whole-and to understand a part it is important to understand the whole to which it belongs and with respect to which it interacts b) a holistic approach is a “must” because the whole is not a mere sum of its parts but is something more due to the various interactions among its parts: a deuterium atom , for example, is not just made up of a proton, neutron, and an electron but also includes the strong nuclear interaction between the proton and neutron to form the nucleus and the electromagnetic interaction between the nucleus and the electron to form the deuterium atom The various interactions can be short ranged (ie, effective over a short distance only-eg, strong nuclear interactions, weak nuclear interactions) or long ranged (effective over any distance- eg, gravitational and electromagnetic interactions are long ranged) . c) hence, everything affects everything else because of the principle of the interaction, interconnectedness or interrelatedness and hence, the interdependence of everything to everything else.

In this paper, in view of the above arguments, we postulate that an integral ecology is composed of environmental ecology and divine ecology . We first consider the more familiar part , Environmental Ecology (the interactions of the various parts of the environment among themselves or Horizontal Ecology) and then we try to gain a bigger picture by considering how God, the Creator and Origin of all things , interacts with his Creation and vice-versa: (Divine Ecology=Vertical Ecology)

By so doing, we are better able to understand the intrinsic or absolute worth of each creature and the impact of our actions on the environment and consequently , be better motivated and more knowledgeable in protecting and caring for it. Besides, when people see how things are connected to God, they are better inspired to do the consequences of such knowing –even if at times this requires more effort. Such has been the case for many people especially the saints and heroes of nations whose battle cry is : “For God and country!”

Environmental Ecology:

(Horizontal Ecology = the various components of the created environment interacting among themselves: among the same species or with different species)

Environmental Element/Component:	Nature of Interactions	Effect/Consequences of Interaction
Material, Non-living (eg, rocks, soil, water, air, sunlight, minerals, etc)	Exchange/flow of matter and energy Eg, - Sun and Earth attract each other with a gravitational force/energy that helps keep the Earth orbiting around the Sun -Nuclei and electrons attract each other via an electromagnetic force/energy that helps keep the atom intact -elementary particles like quarks	1. Formation of structure in the universe (stars, galaxies , etc) are formed due to gravitational, electromagnetic, strong and weak nuclear inter- actions) 2. Various phenomena arise: nuclei and atoms are formed due to strong nuclear and electromagnetic interactions; stars orbit around the galactic center

	exchange force-carrier particles called gluons in order to form bigger particles like protons and neutrons; protons and neutrons interact via the strong nuclear force to form the nucleus of the atom	due to gravitational interaction, radioactivity arises due to weak nuclear interactions inside nuclei which can give rise to greater stability or to transmutation (change in identity) of the elements
Material, Living –eg, microorganisms like molds, bacteria, etc, plants, animals, human beings	Exchange/flow of matter and energy Eg, during photosynthesis, plants take in carbon dioxide, sunlight, and water from the environment in order to make food and oxygen for themselves and us while animals (including us) take in oxygen from the atmosphere and from plants to burn the food that we take (eg, from plants) to energize ourselves, run body processes, and produce the carbon dioxide and water that plants need to live and make food	Establishment of food chains and food webs ; predator-prey roles and relationships; producer-consumer-decomposer roles and relationships, classification of consumers into herbivores, carnivores, omnivores, detritivores, etc; detritivores and decomposers (usually microorganisms) help in the recycling process of dead or decaying materials so they can be used again to nourish living things and so that the earth is cleansed and freed of dead or decomposing materials.
Spiritual, Living (beings with intellect and free will)	Exchange/flow of truth, love Truth=agreement between the mind and reality; ideas that are in harmony with reality ; love=wanting the good of another; being attracted to the good : this is expressed in deeds, gestures, words, gifts, etc	-persons grow spiritually: better thinkers, greater will power, etc -stronger spiritual bonds -happier, more contented, and more peaceful, more creative persons -associations are formed

Anthropogenic climate change is a consequence of countless interactions between human beings and the environment: because of our unsustainable activities , we dump a lot more greenhouse gases into the atmosphere through our various projects (eg, energy-production, deforestation for industrial purposes, manufacturing processes, transport, etc) at a much faster rate than can be assimilated by the environment and then we remove the carbon sinks (eg, trees through deforestation, etc) that are the natural mechanisms needed to clean up the atmosphere and prevent floods and erosions) so the Earth heats up and we have the adverse effects of climate change in terms of stronger typhoons, floods, melting of glaciers and ice sheets, sea level rise, droughts that reduce the productivity of the land and endanger the lives of many people , disruption of ecological balance and the various ecological services, etc.

Divine Ecology

(Vertical Ecology= God interacting with His Creation ; Creation interacting with God the Creator) .

God , an infinite pure spirit, loves and creates (gives existence to) various beings (ie, it is better to exist than not to exist !) as an expression of his infinite love. God interacts with us by giving us an abundance of gifts: He created us, human beings, giving us the gift of existence and the gift of life and gave us the Earth and the Universe to help sustain our existence and our life. How he interacts with his creatures can be seen in his projects of creation, redemption (a kind of restoration project) , sanctification (a development project= sustaining supernatural life and developing it in terms of increase in grace and acquisition and practice of supernatural virtues) which are still on-going and which he carries out with the cooperation of his rational creatures

God's expresses his love through his Gifts to his creation	Sustained by his gifts of :
The gift of material existence	<ul style="list-style-type: none"> • The planet earth and the universe and its laws of nature
The gift of material life	<ul style="list-style-type: none"> • Planet earth , family and society (for animals and humans)
The gift of spiritual life (having intellect and free will)	<ul style="list-style-type: none"> • Family , society, learning institutions, etc
The gift of supernatural life (the gift of becoming an adopted COO (ie, Child of the Owner of the Universe !) – or divine filiation	<ul style="list-style-type: none"> • His only begotten son, Jesus Christ, his Mother Holy Mary, and his mystical body, the universal Church that : <ol style="list-style-type: none"> 1) administers the sacraments Christ instituted to communicate and sustain the divine or supernatural life in us 2) teaches us supernatural truths that Christ himself revealed ; 3) teaches us the commandments of love of God and of neighbor as rules to guide the way we must live and deal with God and others: doing otherwise would damage us and prevent us from reaching our full potential • The family as a domestic Church

Divine Ecology:

Through his Works or Projects, God gives expression to his love and enables his creatures to interact with him, helping them to increase in perfection or development when they cooperate (actively as in rational creatures and passively as in non-rational creatures) with him in bringing these projects to fulfilling the purpose for which God created them . We now focus here on human beings as God's creation

God's Works or Projects	Examples of Human Cooperation in God's Work or Project	
Creation	Brings humans into existence and the corresponding life-support system and home for them : the Earth, the family, society, the Church	-when families welcome and nurture the new life/lives/off-spring that God sends to them -when families care for those that are sick, need attention, etc
Redemption (Restoration)	God cleanses and restores his damaged creation and brings them	-when we participate in the tasks of education, research,

	back to the supernatural level and even improves this level	governance , formation, other forms of work, etc and apostolate for supernatural reasons -Christ as man takes part in the divine project of Redemption
Sanctification	God sends us his Holy Spirit, shares with us his Mother Mary, and establishes the Church to help us in our struggle for our sanctification ie, the maintenance and development of our supernatural life	-when we humans strive to live the truths and consequences of our faith, we cooperate in God's project of sanctification -also when we pray (man interacting with God) and receive the sacraments (God giving himself to man to give him life and strengthen him supernaturally), do good works (this can include care for the environment and care for human beings) , cultivate and practice supernatural virtues of faith, hope, charity- we cooperate with God in his project or work of sanctification or supernatural development

Note: God is not part of the created environment but is the creator of the environment and as Pope Francis wrote, is present in the environment and transcends it .Angels are supernatural beings with keen intellects and free wills that God has created for his own glory and they love God by doing his will at all times and have the mission of cooperating in God's projects of Redemption, etc. We interact with the angels by praying to them for help for various needs and intentions, thanking them, etc. Historical accounts have shown the various roles of angels in the lives of individuals and of nations (eg, Portugal)

Benefits of Knowing Integral Ecology:

A holistic or fuller understanding of the environment is necessary for more effective action to preserve or restore its health. The decisions we make are influenced by or based on the knowledge that we have in our minds about reality : the reality about man, the reality about other creatures, the reality about our common origin and future or end , the creator of all things –almighty God. The fuller our knowledge is, the better the decisions we can make about things because by seeing the whole we are able to determine the relative importance of things and thus acquire a better system of priorities- we see the order of importance of various things. Besides, by seeing a fuller reality, we are also able to see more possible alternatives to attain various goals, etc. And then the chances of success become greater if we have made better decisions and choices in doing something. And we have to remember that the whole is not a mere sum of its parts but something more because of the interactions of its various parts. The various natural and social sciences help us to understand how things work and thus can point to us innovative ways and processes that can be followed to achieve specific goals of sustainable development like achieving sustainable energy, food and water security, etc . The

theological and philosophical sciences help us to achieve a much broader view of reality and to understand more deeply the true nature, purpose, and tremendous dignity of every human being hence provides the continuing motive power for everyone to strive to protect and push for the integral development of every human being on Earth.

God's Gifts of Life: God gave his creation the gift of life besides the gift of existence to his creatures: in particular, the gift of material life to plants, animals and human beings, the gift of spiritual life to human beings, and the gift of supernatural life to human beings and angels. Thus, we see here man's great dignity: he has been given all possible gifts: existence, material life, spiritual life, supernatural life !With humans' free will or the capability to freely choose their actions and interactions with their fellow beings and the environment, we see that the social and anthropological science of psychology, which deals with the study of human behavior and ways by which It can be modified (and is included in human ecology and therefore integral ecology), has an important role to play in directing man's actions towards caring for the environment instead of thoughtlessly dealing with it and harming it as a consequence.

III. Conclusion: Practical Consequences of Knowing an Integral Ecology:

From the encyclical of Pope Francis I and our discussion of integral ecology, we can remind ourselves of more specific actions and habits that can be for the benefit of our planetary environment :

1. We need to develop a greater sense of gratitude and appreciation for Planet Earth and all the creatures in it – that God gave us to serve as our common home and life support system. Thus, thanking God everyday and also thanking those who facilitate life for us each day, praying before and after meals (as the Pope has told us), can be constant reminders of our responsibility to take good care God's creation for his sake and for the sake of all the human beings and other creatures, present and future, that depend on it to survive and live. We tend to better take care of things when we know that some very important person has given them to us for our own good.!

2. We need to change our lifestyles towards a more sober or sustainable one-something that really focuses on our essential needs as social persons and not just based on an over consumerist attitude that thinks that "more is always better" instead of "sometimes, having less can be better": for something more concrete, we can walk more whenever possible instead of riding a motor vehicle that burns up carbon emitting fuel (walking strengthens our body, enables us to spend less, helps us think better, etc), switch off unnecessary lights, write on both sides of the paper instead of only one, etc., moderate the aircon, use more of renewable energy sources (eg, solar, wind, etc), use the internet and social media only when really needed, buy energy efficient appliances and cars, etc.

3. Reduce the use of material resources but focus more on the use and accumulation of spiritual resources (eg, knowledge of the sciences, culture, the arts, supernatural graces, etc); strive for eco-efficiency :using waste materials as input materials for other things, recycle, reuse, repair, reduce. Note that God himself, although infinitely creative, exercises these ecological practices not just in relation to his material creation: he imposes

the laws of conservation of matter, energy, momentum, charge, etc. on his material creation, he recycles materials via the water cycle, oxygen cycle, carbon cycle, nitrogen cycle, etc., he even uses the remains of dead stars to make new stars!, he commands that the disciples gather the leftovers into twelve baskets the leftovers of his miracle of the multiplication of bread and fishes, etc - but also in his spiritual creation: eg, to save what has been damaged and lost due to sin, God's son offers his life to repair the damage and restore us back to life (supernatural life) and works on perfecting us, developing us through the Holy Spirit's work of sanctification, sharing with us his own Mother to facilitate the struggle to be saints. So perhaps we can also say that God is a conservationist and a restorationist.

4. Be better informed and dialogue with others to arrive at better solutions and cooperate towards achieving mutually agreed upon goals: more heads are better than one; think global and act local and global: plant more trees, avoid deforestation, cooperate with others in reducing greenhouse gas emissions that foster climate change, do scientific research on how to do things more efficiently, generating less waste, etc. Work for the sustainability of the planet: for businesses, besides striving for reasonable profits, the supposed "lifeblood of business", must also work to enhance the work and living conditions of their stakeholders (staff, customers, communities they operate in), protect and enhance the environment by sponsoring reforestation, biodiversity conservation, social outreach projects, institute good governance practices, policies, promote good culture, promote cleaner energy sources, etc., learn the science and art of sustainable harvesting of resources –ie, harvest resources at a rate at which nature is given time to recover or to regenerate itself and cleanse itself: problems arise when we consume natural resources and dump pollution at rates faster than nature can regenerate itself and cleanse itself. In man-made global warming for instance, with all our energy-production, manufacturing, and transport activities, we produce a lot more CO₂ at rate faster than the rate at which nature can sequester or remove the excess CO₂ from the atmosphere through plant use and storage in various structures (inside the earth, limestone, etc).

5. Actively promote peace in the family, community, nations, in the world. Conflicts and wars are very harmful to the environment including human beings. Knowledge of how things work, beliefs, goals, the ultimate origin and ultimate future of things can lead a human being to modify his/her behavior towards the more long term good instead of the immediate good. Let us bear in mind at all times our responsibility as stewards of creation.

Tim Flannery, climate change and environmental sustainability expert, refers to this responsibility in his book Here on Earth: "The truth is that no other species can perceive environmental problems or correct them, which means that the responsibility for managing this world of wounds we've created is uniquely ours."

6. Pope Francis, in his January 18, 2015 speech to the Filipino youth gathered at the University of Santo Tomas campus in Manila, said: "As stewards of God's creation, we are called to make the Earth a beautiful garden for the human family. When we destroy our forests, ravage our soil, and pollute our seas, we betray our noble calling." Since the natural sciences give us information and data on how things work and therefore on how to sustainably manage and justly use the Earth's natural resources, it is important for countries to give a lot of support and encouragement for continuing research and educational programs in the natural sciences and for policy and decision makers to be informed about the progress of science and its role in sustainable development

6. Pray to God to inspire us all and sustain our motivation (it's easy to start but hard to persevere to completion !) to take care of his creation and to have a sense of service, sacrifice and generosity for our fellow humans. Also strive to get to know the science of faith and the sciences of creation better- both kinds are sources of great delight and both can be paths leading us to God .

Finally, following Saint and Pope Francis, we end up with a poem that highlights a particular aspect of Divine Ecology: God's restorative interaction with us, his creatures . He uses as "visual aid" his only begotten Son, Jesus Christ to communicate to us the truth about himself, about ourselves, the world, our ultimate purpose in life, and about the tremendous worth of every human being.

Saving Us!

He vividly sees what he'll have to endure
Horrendous tortures... then death.. for sure!
But ever mindful of his Father's will,
He welcomes pain ..though it would kill!

"All for Love!", he wearily sighs
As bloody sweat begins to blur his eyes
"That I may gain all that's been lost,
By obeying my Father,- no matter the cost!"

Him, they strip and bind to a pillar
To be brutally scourged with the rage of war
A crown of thorns they dump on his head
And crimson rivulets ooze down his forehead!

A heavy cross they make him bear
On his wounded shoulders his spirit to tear
The trek to Calvary they make him take

To hang on a tree, our salvation at stake !

A tree of life it turns out to be
This cross on which God sets us free
From the sting of sin that snuffs out life
By giving himself as Bread of Life !

He suffers, dies and rises again
That a fuller life we may all attain
His Mother he shares and his Spirit he sends - to give us strength
For our journey through life's arduous length !

And we, poor humans, the cause of God's sufferings
So slow in responding to his crazy loving
Must make amends for such gross unfeeling
Embrace him now and requite his loving !!

-TCPonce

Indeed, one way we can reciprocate God's "crazy loving" , as St. Josemaria Escriva would describe it, is by being channels of his love for all his creatures: caring for all human beings especially the unborn or newly born, needy, the sick and the persecuted as well as the rest of the environment !

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