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**FUNCTIONAL DEGROWTH:
MATCHING DEGROWTH DYNAMICS**
A Viewpoint paper

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Abstract

The debate about growth on global level has extensively increased. Picturing growth on canvas, we draw its current model (forced growth) on one side; on the other side is illustrated within an alternative model (Degrowth). Individuals and groups of people within varying growth stages, in different parts of the world, understand and relate with universe in their own quirky way; but canvas (growth), revealing the notion of opposites in growth models, still remains priceless. These individuals or groups of people or even the human race as a whole are connected to canvas with an indiscernible by them, relationship. They use canvas's recourses, direct (primary sector of economy) or indirect (secondary sector of economy), or as end users (tertiary sector of economy). Among these resources, Indigenous knowledge (IK) and agriculture are dynamics in the core of canvas, contributing multiply to Degrowth transition from bottom-up. To match these dynamics, even if in a circle the beginning and its end are common, is necessary to have a frame process. Author introduces the term Functional Degrowth and describes it, as the frame matching degrowth dynamics. Some key questions addressed are: Quoting fundamental reasoning can we characterize with certainty, that, Degrowth is an episteme? Matching indigenous knowledge (henceforth IK) and agriculture into farming practices offers a ready to go solution? The reality is that strong public international and institutional interests have been and still are the driving forces behind the ongoing debate for Degrowth and its outcomes, verifying General George S. Patton, that "*if everybody is thinking alike, then nobody is thinking*". On global level the rapid differentiation of forced growth leads humankind to recall what was said by Francis Bacon; "*If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties*". Measurable results from existing indicators of modern growth, confirm that our society began with certainties.

Key-Words: IK, Agriculture, Degrowth Episteme, Degrowth dynamics, Functional Degrowth.

1. Introduction

According to the philosophers and scholars, who instituted the encyclopedist's movement in 18th century, the tasks of the philosophy concern the finding of solutions on practical issues. The big inventions and the vigorous steps of humanity in many sectors after 18th century, have their origin in the previous mentioned principle, consist a *res ipsa loquitur pact*; the matter speaks for itself. (Kyriakakis 2004)^[1] By this point of view and taking under our consideration the ancient Greek philosopher Heraclitus about the *unity of opposites* adopted later by many and of different origin scholars, everything includes its opposite. Forced Growth and Degrowth is a paradigm. Consequently every problem includes its unique or combined solution(s). Following this in line, Degrowthists, focused thoroughly on outcomes and problems caused by current model of forced growth and by method or case-study research develop the antidote.

Degrowth theory. In sum, degrowth is about having production and consumption that do not exploit natural resources and living beings, or that exploit them at a lower level (Schneider et al.,2012).^[2] A method, as mentioned by Selener et al., "*that facilitates the description, reflection, analysis and documentation in a continuous and participative manner, of the processes and results of a development project*" can greatly assist in the documentation of field based information (data). Such a method and approach makes it possible to look in detail at what is being done and to reflect critically on what is being achieved. It will help those involved to see their own project or experience from another perspective. As such, it can highlight the positive aspects of an experience as well as those which could be improved. A detailed documentation process forces us to go through a self-criticism process, and to be open to suggestions and opinions which may come out as a result of the interaction with others. In the end, it helps us to

generate knowledge which will improve our practices, activities or project and its results (Tarfur et al., 2007).^[3] In 2004, Schneider started a tour of France with a donkey for more than one year, spreading the proposal of degrowth. Many of the ideas presented in the article titled "*What is Degrowth? From an Activist Slogan to a Social Movement*" by Schneider et al., 2012, come from that tour and following public talks, which could be seen as an original way of doing field work and dissemination at the same time (Schneider et al., op-cit). According to the conventional view, a case and a case study cannot be of value in and of themselves; they need to be linked to hypotheses, following the well-known hypothetico-deductive model of explanation. (Flyvbjerg, 2006).^[4] The case study by Kealan is about a hypothetical nation that has chosen to abandon the traditional economic growth model in favor of degrowth, with the goal of sustainable well-being for the nation's population. In the study Kealan focus on agriculture as a mean of producing materials and energy that may sustain an adequate standard of life. Among the competing methods to replace extractive industry, agricultural biomass has several advantages. It is low tech, and requires only water, sunlight, nutrients. High-tech solar, hydrogen, geothermal, and wind relies heavily on various material and energy inputs for manufacture, and generally provides energy, but not materials, food or shelter. Society is facing various cultural and resource problems that could be solved by decreasing economic production. Physiological human needs may be met, while abandoning metal and fossil resource extraction, by encouraging high levels of local net primary production through improved economic value systems and agricultural land use. In a closed-loop scenario, organic, high biodiversity cropping with extensive plant cover, no till, labour intensive farming will produce the highest yield and level of sustainability over the long term. Decreasing levels of population density and per capita consumption will improve the probability of future resource self sufficiency for humans within the biosphere (Kealan, 2008).^[5] The case study is a necessary and sufficient method for certain important research tasks in the social sciences, and it is a method that holds up well when compared to other methods in the gamut of social science research methodology. Let us then assume that crises are a necessary precondition for the emergence of novel theories and ask next how scientists respond to their existence. Part of the

answer, as obvious as it is important, can be discovered by noting first what scientists never do when confronted by even severe and prolonged anomalies. Though they may begin to lose faith and then to consider alternatives, they do not renounce the paradigm that has led them into crisis. They do not, that is, treat anomalies as counter-instances, though in the vocabulary of philosophy of science that is what they are. No process yet disclosed by the historical study of scientific development at all resembles the methodological stereotype of falsification by direct comparison with nature. That remark does not mean that scientists do not reject scientific theories, or that experience and experiment are not essential to the process in which they do so. But it does mean—what will ultimately be a central point—that the act of judgment that leads scientists to reject a previously accepted theory is always based upon more than a comparison of that theory with the world. The decision to reject one paradigm is always simultaneously the decision to accept another, and the judgment leading to that decision involves the comparison of both paradigms with nature and with each other (Kuhn, 1970).^[6] Degrowth is rich in its meanings and does not embrace one single philosophical current. Its practitioners do not admire a single book or an author. Its thematic backbone derives from some streams of ecological and social thought (Schneider op-cit). Degrowth theory emerged from forced growth crisis. The word "*competition*" which characterize forced growth trajectory, doesn't exist in degrowth vocabulary.

2. "*History, is Philosophy learned from examples*". Thucydides.

In the decades since the Second World War, the rhetoric of development has gone through several stages—from its focus on economic growth, to growth with equity, to basic needs, to participatory development, to sustainable development (Agrawal 1995).^[7] In the 1960s the modernization paradigm of development was roundly condemned for its Eurocentric bias, its notion of linear stages of growth, and its positivist reduction of the study of development to measuring and comparing indices of economic growth (Howard 1994)^[8]. In 1968 individuals of different origin and knowledge gathered in Academia dei Lincei in Rome forming

an "informal round table" known as the Club of Rome. This was caused by the certainty of those individuals that; (a) planet is at risk (b) current model of growth increases planet's vulnerability and (c) that growth problems are diachronic. Their commitment in a base of equality of rights was to use the body of knowledge at each one's disposal to discuss and document an alternative approach to wealth and the means to reduce exploitation of sources in favor of mankind without- at the same time- limiting development. During this informal round table the globe was viewed in detail through a Polemoscope. At the end a non monolithic theory in a type of report was published to oppose the existence notion of the linear stages of growth. The report was titled *Limits to Growth* (Meadows et al., 1972).^[9] The word "décroissance" was mentioned at different occasion after the publication of the report of the club of Rome. At the time the public debate focused on the idea of zero-growth, i.e. stopping the growth of production and consumption, but the idea and the word décroissance was mentioned. "Décroissance" was thrown in the public debate in 2001 by anti-car and anti-advert activists. It spread into a small social movement in the context of ecological, social, resource, and lately financial crisis. Décroissance got translated by decrescita in Italian, decreixement in Catalan decrecimiento in Spanish and degrowth in English. The concept obtained some academic and civil society recognition at the first (Paris) and second (Barcelona) international Conferences on Economic Degrowth for Ecological Sustainability and Social Equity. The idea and translation of degrowth is now disseminating (Schneider)^[10] and the recommended idea along with what constitutes its *what if*, triggers the adoption of change. The world is still viewed by academic and civil society through the Polemoscope which is an optical device that looks like a small telescope. It dates back to the opera houses of the late 1700s where curious patrons used it to spy on other members of the audience while the Polemoscope itself was pointed at the stage. A mirror set at an angle inside the device gives a clear 45-degree angle view to the side. The Polemoscope doesn't magnify or distort what I see; it simply allows me to look at the world from a different angle (Johnson, 2014).^[11] The man who is striving to solve a problem defined by existing knowledge and technique is not, however, just looking around. He knows what he wants to achieve, and he designs his instruments and directs his thoughts accordingly.

(Kuhn op-cit). Degrowth as theory is verified by life, in contrast of what was noted by Alexander that "*models and interpretations of disaster abound, but the phenomenon is so multi-faceted that a general theory of universal explanatory power is unlikely ever to be formulated*" and benefits from its own "virtual budget" called *awareness*. (What happened yesterday, what is happening today and, what will happen tomorrow?). One answer to the question on how we can achieve sustainable growth is given by observing and mimicry Nature. Nature practices degrowth and gains growth in a circular mode of development. Nature is an incredible University for learning from, not experimenting with. It is author's believe that of the meeting held in 1968 in junction with in nowadays ongoing further academic and social debates on the matter, the bellow outcomes appear; (a) similar can be served by similar (Development); (b) Degrowth episteme ("the toolbox") must be incorporated into decision making policy toward transition. At a time when the future is more predictable than ever before, the question of whether or not the planet can afford Degrowth should be a non negotiable, easy answer.

2.1 Degrowth declaration

There are, in principle, only three types of phenomena about which a new theory might be developed. The first consists of phenomena already well explained by existing paradigms, and these seldom provide either motive or point of departure for theory construction. A second class of phenomena consists of those whose nature is indicated by existing paradigms but whose details can be understood only through further theory articulation. These are the phenomena to which scientists direct their research much of the time, but that research aims at the articulation of existing paradigms rather than at the invention of new ones. Only when these attempts of articulation fail, do scientists encounter the third type of phenomena, the recognized anomalies whose characteristic feature is their stubborn refusal to be assimilated to existing paradigms. This type alone gives rise to new theories. Paradigms provide all phenomena except anomalies with a theory-determined place in the scientist's field of vision. But if new theories are called forth to resolve anomalies in the relation of an existing theory to nature, then the successful new theory must somewhere permit predictions that are different from those derived from its predecessor.

(Kuhn, op-cit). In the midst of an international crisis more than four hundred researchers, practitioners and civil society members from forty countries gathered in Barcelona in March 2010 for the Second International Conference on Degrowth. The Declaration of the First International Conference in Paris in 2008 noted the looming multidimensional crisis, which was not just financial, but also economic, social, cultural, energetic, political and ecological. The crisis is a result of the failure of an economic model based on growth. An international elite and a "global middle class" are causing havoc to the environment through conspicuous consumption and the excessive appropriation of human and natural resources. Their consumption patterns lead to further environmental and social damage when imitated by the rest of society in a vicious circle of status-seeking through the accumulation of material possessions. While irresponsible financial institutions, multi-national corporations and governments are rightly at the forefront of public criticism, this crisis has deeper structural causes. So-called anti-crisis measures that seek to boost economic growth will worsen inequalities and environmental conditions in the long-run. The illusion of a "debt-fuelled growth", i.e. forcing the economy to grow in order to pay debt, will end in social disaster, passing on economic and ecological debts to future generations and to the poor. A process of degrowth of the world economy is inevitable and will ultimately benefit the environment, but the challenge is how to manage the process so that it is socially equitable at national and global scales. This is the challenge of the Degrowth movement, originating in rich countries in Europe and elsewhere, where the change must start from. Academics, activists and practitioners met in Barcelona to structure proposals toward an alternative, ecologically sustainable and socially equitable degrowth society. The conference was conducted in an inclusive and participatory way. In addition to standard scientific presentations, some 29 working groups discussed hands-on policies for degrowth and defined research questions, bringing together economic, social and environmental concerns. New ideas and issues absent from mainstream dialogue on sustainable development were put on the table: currencies and financial institutions, social security and working hours, population and resource consumption, restrictions to advertising, moratoria on infrastructure and resource sanctuaries, and many others. A wealth of new

proposals evolved, including: (a) facilitation of local currencies; (b) gradual elimination of fiat money and reforms of interest; (c) promotion of small scale, self-managed not-for-profit companies; (d) defense and expansion of local commons and establishment of new jurisdictions for global commons; (e) establishment of integrated policies of reduced working hours (work-sharing) and introduction of a basic income; (f) conversion of car-based infrastructure to walking, biking and open common spaces; (g) taxation of excessive advertising and its prohibition from public spaces; (h) abandonment of large-scale infrastructure such as nuclear plants, dams, incinerators, high-speed transportation; (i) institutionalization of an income ceiling based on maximum-minimum ratios; (j) discouragement of overconsumption of non-durable goods and under-use of durables by regulation, taxation or bottom-up approaches; (k) support for environmental justice movements of the South that struggle against resource extraction; (l) introduction of global extractive moratoria in areas with high biodiversity and cultural value, and compensation for leaving resources in the ground; (m) denouncement of top-down population control measures and support of women's reproductive rights, conscious procreation and the right to free migration while welcoming a decrease in world birth rates; (n) decommercialization of politics and enhancement of direct participation in decision-making. We assert that these proposals are not utopian: new redistributive taxes will address income inequality and finance social investments and discourage consumption and environmental damage, while reduced working hours with a reinforced social security system will manage unemployment. As the economy of wealthy parts of the world quietly contracts and our damage to the environment through new infrastructures and extraction activities is constrained, well-being will increase through public investments in low-cost social and relational goods. Every new proposal generates several new objections and questions. We do not claim to have a recipe for the future, but we can no longer pretend that we can keep growing as if nothing has happened. The folly of growth has come to an end. The challenge now is how to transform, and the debate has just begun (Declaration Barcelona 2010).^[12]

3. Definitions

Agriculture: Agriculture, under the wider meaning of the word, is the art through which organic beings (plants and animals) transform inorganic matter (soil, water, wind) to organic (meat, flour, wool, etc.). (Dimitriadis, 1891)^[13]

Agriculture Indigenous Knowledge (AIK): is an unwritten body of knowledge. It is held in different brains, languages and skills, in as many groups, cultures and environment as are available today (Abioye et al., 2011)^[14]

Degrowth: is the intentional redirection of economies away from the perpetual pursuit of growth. For economies beyond the limits of their ecosystems, this includes a planned and controlled contraction to get back in line with planetary boundaries, with the eventual creation of a steady-state economic system that is in balance with Earth's limits. Degrowth should not be confused with economic decline. As Serge Latouche, a leading thinker on degrowth, explains, *"The movement for a 'degrowth society' is radically different from the recession that is widespread today. Degrowth does not mean the decay or suffering often imagined by those new to this concept. Instead, degrowth can be compared to a healthy diet voluntarily undertaken to improve a person's well-being, while negative economic growth can be compared to starvation."* Ultimately degrowth is a process, not the end point. As Latouche notes, the end point is abandoning faith in the promise of growth as driver of development. Economist Tim Jackson puts this idea in a user-friendly way, calling for *"prosperity without growth."* However, that prosperity should not be confused with what is deemed prosperity by many today—a consumer lifestyle—as that depends on a growth economic model and overuse of Earth's natural capital. Instead, as Latouche explains, a prosperous society is one *"in which we can live better lives whilst working less and consuming less."* Thus degrowth will be a step toward a more secure, sustainable, sane, and just future, helping to reduce the number and size of ecologically destructive industries and to reorient economies in ways that improve wellbeing, strengthen community resilience, and restore Earth's systems; a path that from any sane perspective would be hard to confuse with economic decline. (Assadourian 2012).^[15]

Degrowthist: the person observing consciously the manner (circumstances) and outcomes (pathologies

and obstacles) of things taking place into forced growth sphere (system). When classified these observations from data collected, warnings appear in system structure. Disseminating appeared warnings together with suggested alternative proposals, and along with personal commitment, prove that Growth is more than a monolithic, or a twofold approach. **Functional Degrowth:** The participatory (fig. 1), holistic (fig. 2), strategy (fig.3), and critical thinking circle, matching degrowth dynamics, within the frame of Degrowth episteme. It is *participatory*;

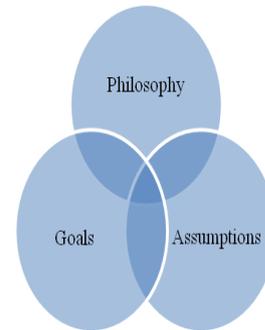


Figure 1.

Because the philosophy, goals, and assumptions of its key stakeholders (Natural resources, Humankind, Balance, Harmony, etc.) are involved in genuine participation. It is *holistic*;



Figure 2.

Because matches resources, assets, concerns, goals, and actions of different origin. As such, critical thinking is a prerequisite condition offering balance, because critical thinking can be decisive without been stubborn, evaluative without been judgmental, and forceful without been opinionated (Facione 2015).^[16] It is a mechanism, because as such, refers to the process of getting things done, effectively and efficiently through other people or means. It is a strategy, not a quick fix one;

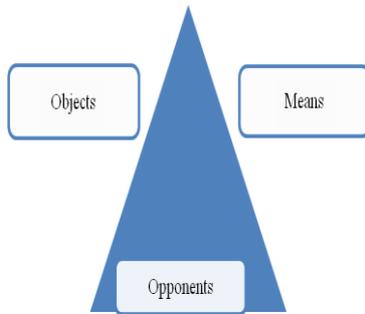
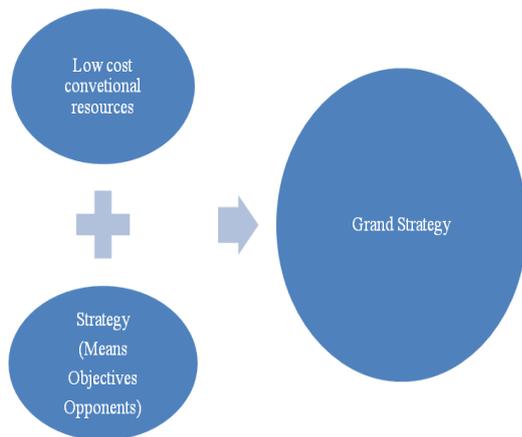
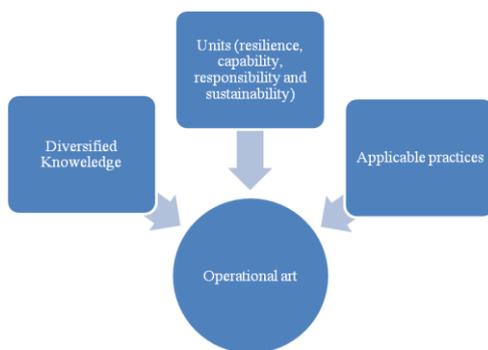


Figure 3.

Because it constitutes of the triangle means-objects-opponent; which when applied in the complex frame of universe to achieve the stated objectives, using always conventional low cost resources, then, it becomes grand strategy.



It is an operational art;



Because involves resilience, capability, responsibility and sustainability as units, along with diversified knowledge and applicable practices. *Indigenous Knowledge*: IK is local environmental knowledge (knowledge of plants, animals, soils and other natural components) with practical applications, rather than the more encompassing sense of IK associated with environmental philosophies or world-views, or even ITK

(indigenous technical knowledge) in its wider sense. However, we accept that such practical, technical and empirical knowledge is characteristically embedded, linked to, and informed by these broader understandings. It is assumed that most readers will already be persuaded that indigenous environmental knowledge can hardly be ignored in development contexts, as well as having applications in industry and commerce. Some, indeed, argue that the term 'indigenous' forces us into an oppositional logic of "us and them" while others assert that the category of IK is wholly compromised by the "hegemonic opposition" of the privileged us to the subordinated them, and therefore is morally objectionable as well as being practically useless (Ellen and Harris, 1996).^[17] IK is commonly held by communities rather than by individuals. IK provides problem-solving strategies for local communities, especially for the poor. IK is tacit knowledge and therefore difficult to codify, it is embedded in community practices, institutions, relationships and rituals. IK represents an important contribution to global development knowledge. IK systems are at risk of becoming extinct. IK is relevant for the development process. IK is an underutilized resource in the development process. The vision of a truly global knowledge partnership can only be realized if the poor participate not only as users of but also as contributors to knowledge. (Sabetghadam, undated)^[18]

4. Fundamental reasoning; building the base from theory to episteme.

4.1. Philosophical underpinnings

The word Episteme is derived from the Greek word *ἐπιστήμη*, and the word science is derived from the Latin word *scientia*. Both words mean knowledge. Author prefers to use here the term episteme which initially and in its literally meaning indicates the organized body of integrated and proven knowledge. The first definition of episteme is expressed in Plato's dialogue *Theaetetus* "*ἐστὶν οὖν ἐπιστήμη δόξα ἀληθὴς μετὰ λόγου*"; therefore, science consists knowledge confirmed with logical arguments. Science (episteme) is the aggregate of knowledge about a subject. This implies that every science has its own orderly system of knowledge that centers on its own field, and that there are specific methods of broadening that knowledge. Knowledge or systems of knowledge, is related to

particular facets of the world of phenomena around us. Therefore all sciences, no matter how abstract their content may appear, are relevant to society; that is, the theoretical thinking is related to some facet of human existence. In other words, sciences derive knowledge from one another, and they make knowledge available to one another, contributing to the clarification of facets of individual fields. Derivative or supplementary knowledge cannot, however, form a basic system of knowledge for the recipient science. It has always to be assimilated into a given system of knowledge, where its only purpose is to provide clarity in the particular field of specialization. The fact that one science springs from another does not mean that the new science is dependent only on the knowledge of the mother science. In fact, derivation is only of academic interest, in the sense that the derived science obtains the status of an academic discipline through the mother science. Before its breakaway in the development of its own specialized field, the expansion of knowledge is symposia rather than unilateral. In other words, the new system of knowledge is related not only to the mother science (unilateral) but also to various other sciences (symposia). When scientific study is described as theoretical-philosophical, this does not mean that the particular sphere of knowledge of the various sciences exists in a vacuum, independently of social reality. In earlier times there was a desire for “knowledge for the sake of knowledge” irrespective of any applicability to the social context, but this has been replaced by a demand that knowledge should be socially relevant. This does not mean that science is functionally oriented; in other words, it is not concerned with *how* practitioners should behave in practice, but concentrates rather on the *whys*; that is on a thorough examination of problems so that they can be understood and explained. Scientific theorizing arises mainly from social reality so that the knowledge acquired can be applied in practice. (Kyriakakis, 2005).^[19] In every branch of knowledge, example has preceded precept. Hence there is not an absurd theory or an extravagant opinion that has not been supported by an appeal to facts; and it is by facts also that public authorities have been so often misled. But, is the whole extent of the meaning of the term, *facts*, so often made use of, perfectly understood? It appears to me that this word at once designates *objects that exist* and *events that take place*; thus, presenting two classes of facts: it is, for example, one fact, that such an object exist;

another fact that such an event takes place in such a manner. *Objects that exist*, in order to serve as the basis of certain reasoning, must be seen exactly as they are, under every point of view, with all their qualities. Otherwise, whilst supposing ourselves to be reasoning respecting the same thing, we may, under the same name, be treating two different things. The second class of *facts*, namely, *events that take place*, consists of the phenomena exhibited, when we observe the manner in which things take place. It is for instance a fact that metals, when exposed to a certain degree of heat, become fluid. The manner in which things exist and take place, constitutes what is called *the nature of things*; and a careful observation of the nature of things is the sole foundation of all truth. But *facts that take place*, may be considered in two points of view; either as *general* or *constant*, or as *particular* or *variable*. *General facts* are the results of the nature of things in all analogous cases; *particular facts* as truly result from the nature of things, but they are the result of several operations modified by each other in a particular case. The former are not less incontrovertible than the later, even when apparently they contradict each other. But a knowledge of facts, without a knowledge of their mutual relations, without being able to show why the one is a cause and the other a consequence, is really no better than the crude information of an office clerk, of whom the most intelligent seldom becomes acquainted with more than one particular series, which only enables him to examine a question in a single point of view. As every fact may be said to have a particular cause it is in the spirit of system to determine the cause; it is in the spirit of analysis to be solicitous to know *why* a particular cause has produced this effect, in order to be satisfied that it could not have been produced by any other cause. Nothing can be idle than the opposition of *theory* to *practice*. What is theory if it be not a knowledge of the laws which connects effects with their causes, or facts with facts? And who can be better acquainted with facts than the theorist who surveys them under all their aspects, and comprehends their relation to each other? And what is practice without theory, but the employment of means without knowing how or why they act? (Say, 1851).^[20] Philosophers of science have repeatedly demonstrated that more than one theoretical construction can always be placed upon a given collection of data. History of science indicates that, particularly in the early developmental stages of a new paradigm, it is not

even very difficult to invent such alternates. But that invention of alternates is just what scientists seldom undertake except during the pre-paradigm stage of their science's development and at very special occasions during its subsequent evolution. So long as the tools a paradigm supplies continue to prove capable of solving the problems it defines, science moves fastest and penetrates most deeply through confident employment of those tools. (Kuhn, op-cit).

4.2 The supportive arguments

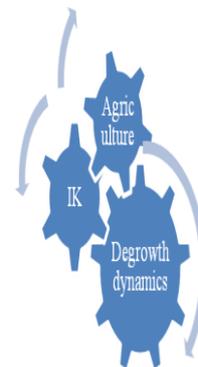
At the concrete point and auxiliary to the foregoing approach of philosophical underpinnings, the below postulates appear, as further supportive arguments; (α) the already existence of explicit and tacit knowledge related to the subject matter (b) the orderly system of indicators under study (c) knowable objects under examination (d) the methodological study of subjective data (e) certain methods that are employed to broaden knowledge (f) observation, identification, description, experimental investigation and theoretical explanation of phenomena (g) universal and necessary truths attained; truths that apply everywhere, at all times, and of necessity must apply.

4.3 Concluding remarks to reasoning base.

The social movement of 'décroissance' and the obtained recognition was the primary step stones to advance with certainty some years later Degrowth. Slowly but steady Degrowthists and followers (been part of the solution and not the problem), carefully observing the manner of things taking place into forced growth sphere and the general laws which govern them, founded an experimental episteme. This episteme unfolds the reciprocal action of phenomena on each other, or in other words, the connection between cause and effect. This episteme, while young and being also episteme of syncretism, is an integrated body of knowledge with virtue (ethics) being its prime characteristic, and as such system (episteme) abides to the classical definition of Plato that: "*Any episteme excluded from virtue cunningness rather than wisdom seems*". One should keep in mind that "science" is an ambiguous term; by it, one may mean, for example: (1) science as an institution (scientific workers, the organization of research), (2) scientific research activity, or the

research process, (3) results generally accepted in the scientific community at a particular moment; scientific knowledge, and (4) the scientific method as a critical and intersubjective method for accepting beliefs (Raatikainen 2006).^[21] As experimental science in order to establish why events take place in a certain manner, or to be able to assign a particular cause for a particular effect, to a certain extent must be descriptive (Say op-cit). Descriptive sciences primarily aim to describe, explain and understand the reality surrounding us (Raatikainen op-cit). Is descriptive, because as a systematic scientific research includes the originating assumption of how phenomena operate (that is the case of *that happens or happened*) and tests this originating assumption within the framework of alternative conditions (*Degrowth*). The outcome of this procedure (*proposals*) lead to the formation of actions which prove that society has fully comprehended and consolidated the procedure of the case of "*that happens or happened*" not only to individual but also to communal and international level. If not, then undoubtedly the saying of Democritus: "*The Humans formed the idol of luck in order to excuse their own luck of initiative. Barely does luck fight prudence while most matters are directed by wise discernment*" is true.

5. Degrowth dynamics



5.1 The intangible; Indigenous Knowledge

The immediate impression toward Indigenous Knowledge is something of the past, fundamental, traditional, mythical, and non-scientific. In the last decade, there has been a significant increasing attention on Indigenous People and their Knowledge and experiences among the scholars in numerous educational institutions and development agencies

worldwide. But, yet the greatest struggles among scholars are the type of approach and lack of clarity they have for defining, understanding, implementing, and exploiting such a valuable knowledge. The published works of the scholars show their approach follow the path similar to that of scholars in modernism and post-modernism era. What is forgotten among all these challenges is to understand about indigenous, knowledge and, experience from the indigenous people in their own term instead of our own perspectives. Before we unwrap our differences, a dialogue should be set out to understand the word or the concept such as knowledge and its indigenous meanings and uses to begin with. In fact, one of the dynamics and objectives of indigenous knowledge is its vital role in blossoming out the commonalities aside from our individualistic ideas. The main philosophy behind indigenous knowledge is to wield our efforts to focus on what is right not on who is right (emphasis added). It is time for academia and higher education systems in particular to learn a lesson or two from Indigenous Communities and commonalities. After all, is not the whole idea of higher education in its teaching and research to be useful for people at local, national, and international level? Similarly, many scholars have made efforts to explain the meanings for Indigenous People and their Knowledge and its importance and complexity. But, only few have made efforts to understand how knowledge and its ethics is valued and perceived in indigenous communities. In fact, the approach taken by many scholars on Indigenous Knowledge and relevant issues have created a dichotomy between traditional and scientific values. Fragmentation is a requirement in scientific settings for its practitioners. In contrast, for traditional practitioners is more apt to use a holistic and experiential approach in their own natural settings. As much as scientific communities and their practitioners rely on science for their continued existence, Indigenous communities and their practitioners rely on local traditional knowledge for their survival. What is important then is to acknowledge, respect and incorporate both appropriately and beneficially. We no longer need more conflicts and instead we need collaborations and understanding of one another. Are not that true the more we acquire knowledge the more we find we do not have much knowledge at all? Why are so many competitions for acquiring knowledge particularly in scientific communities? What is the whole purpose for acquiring

knowledge? Has there been any positive development in our character as much as concern we have for the development of other things? Isn't the time to set aside our differences and share our commonalities? These are the type of questions we may find answers for them if we re-examine our understanding of knowledge, its philosophy and usefulness. We need to build a common ground to share and exchange our knowledge to show we care for one another honestly and piously. In fact, this is exactly one lesson where academic communities can learn from indigenous communities to put into practice. If academic institutions are constructed to be at the service of communities then they both need each other's knowledge for their own survival. (Sabetghadam op-cit). According to the 1998/99 World Development Report, knowledge, not capital, is the key to sustainable social and economic development. Building on local knowledge, the basic component of any country's knowledge system, is the first step to mobilize such capital (World Bank 1998).^[22] Traditionally most of the academic contributors in indigenous knowledge were geographers and anthropologists. Now a broader academic interest is represented in the indigenous knowledge debate including the disciplines of agriculture, horticulture, botany, zoology, forestry ecology, animal science, medicine and pharmacology. One of the reasons for the increase in cross-disciplinary interest and communication is the vision in the academic world that indigenous knowledge could contribute to better understanding of sustainable development in all its ecological and cultural complexity, and therefore had a role to play in the global knowledge system and in participatory approaches to development. (Hagar 2003)^[23] Today, indigenous knowledge is seen as pivotal above all in discussions on sustainable resource use and balanced development (Agrawal op-cit). IK is stored in peoples' memories and activities and is expressed in stories, songs, folklore, proverbs, dances, myths, cultural values, beliefs, rituals, community laws, local language and taxonomy, agricultural practices (emphasis added), equipment, materials, plant species, and animal breeds. IK is shared and communicated orally, by specific example, and through culture. Indigenous forms of communication and organization are vital to local-level decision-making processes and to the preservation, development, and spread of IK. Although each IK system consists of an integrated body of knowledge, researchers interested in

learning more about traditional knowledge systems tend to focus on discrete aspects. A diversity of topics is studied under the rubric of IK research. To convey an appreciation of the scope of the research area, examples are listed below.

(a) Learning systems — indigenous methods of imparting knowledge; indigenous approaches to innovation and experimentation; indigenous games; and indigenous specialists; (b) Local organizations, controls, and enforcement — traditional institutions for environmental management; common-property management practices; traditional decision-making processes; conflict-resolution practices; traditional laws, rights, taboos, and rituals; and community controls on harvesting; (c) Local classification and quantification — a community's definitions and classification of phenomena and local flora and fauna; and indigenous methods of counting and quantifying; (d) Human health — nutrition; human-disease classification systems; traditional medicine and the use of herbal remedies in treatment of diseases; and the locations of medicinal plants, the proper times for collection, the most useful parts, and the methods for preparing and storing medicines; (e) Animals and animal diseases — animal breeding and production; traditional fodder and forage species and their specific uses; animal-disease classification; and traditional ethno veterinary medicine; (f) Water — traditional water-management and water-conservation systems; traditional techniques for irrigation; use of specific species for water conservation; and freshwater and saltwater fisheries and aquatic-resource management; (g) Soil — soil conservation practices; the use of specific species for soil conservation; and soil-fertility enhancement practices; (h) Agriculture — indigenous indicators to determine favorable times to prepare, plant, and harvest gardens; land-preparation practices; indigenous ways to propagate plants; seed storage and processing (drying, threshing, cleaning, and grading); seed practices; indigenous methods of sowing (seed spacing and intercropping); seedling preparation and care; farming and cropping systems (for example, complementary groupings); crop harvesting and storage; food processing and marketing; and pest-management systems and plant-protection methods; (i) Agroforestry and swidden agriculture — indigenous techniques used for recognizing potential swidden farmland and the criteria used for making choices regarding its use; criteria and techniques used for allowing a farm to go fallow;

fallow management and uses; indigenous adaptations for intensification; changes adopted during the shift to sedentary agriculture; the management of forest plots and the productivity of forest plots; the knowledge and use of forest plants (and animals); and the interrelationship between tree species, improved crop yields, and soil fertility; and (j) Other topics — textiles and other local crafts; building materials; energy conversion; indigenous tools; and changes to local systems over time. IK has been lauded as an alternative collective wisdom relevant to a variety of matters at a time when existing norms, values and laws are increasingly called into question. The need for some alternative wisdom in development initiatives is supported by the following observations: (a) Green-revolution technology is associated with ecological deterioration, economic decline (at the local level), and poorer diets and nutritional losses resulting from the eradication of traditional foods or from their substitution by nontraditional foods. (b) Development as planned and implemented for the last 30 years has placed unprecedented pressures on the planet's soils, watersheds, forests, and other natural resources. (c) Some development solutions from outside are based on incorrect assumptions, are not economically feasible or culturally acceptable, and are often abandoned (for example, techniques are too complex or require too much maintenance). (d) Some technical solutions are introduced to solve problems not perceived at the local level and are abandoned. (e) Development interventions tend to benefit small numbers of people from relatively privileged groups. (f) Some critics observe that communities receiving the most externally driven development assistance become less capable of handling their own affairs. (g) Top-down planning fails to promote effective natural-resource management at the local level. In short, development planning has often failed to achieve the desired result: **sustainable development**. In some cases, dependencies have been created by an outside world that orders and demands (through laws and natural resource regulations) but do not truly contribute to development. Communities are often left to find their own means. Development efforts that ignore local circumstances, local technologies, and local systems of knowledge have wasted enormous amounts of time and resources. Compared with many modern technologies, traditional techniques have been tried and tested; are effective, inexpensive, locally available, and culturally

appropriate; and in many cases are based on preserving and building on the patterns and processes of nature. Western techno scientific approaches are (in themselves) an insufficient response to today's complex web of social, economic, political, and environmental challenges. The paradigm in support of "one technology or one knowledge system fits all" has been debunked. IK systems suggest a different approach to problem solving. An elderly woman in northern India was selecting seeds for storage while being interviewed by a researcher about the impacts of modern agriculture. She commented, "It takes a sharp eye, a sensitive hand, and a lot of patience to tell the difference between these seeds. These are not the things that are honored any more". Whereas Western science attempts to isolate a problem — to eliminate its interlinkage with various other factors and to reduce a problem to a small number of controllable parameters — traditional approaches usually examine problems in their entirety, together with their interlinkages and complexities. Development practitioners argue that paying attention to local IK can: Create mutual respect, encourage local participation, and build partnerships for joint problem resolution; Facilitate the design and implementation of culturally appropriate development programs, avoiding costly mistakes; Identify techniques that can be transferred to other regions; Help identify practices suitable for investigation, adaptation, and improvement; and help build a more sustainable future. (Grenier 1998).^[24] If people were exclusively trained in context-independent knowledge and rules, that is, the kind of knowledge which forms the basis of textbooks and computers they would remain at the beginner's level in the learning process. This is the limitation of analytical rationality: it is inadequate for the best results in the exercise of a profession, as student, researcher, or practitioner (Flyvbjerg, op-cit).

5.2 The tangible; Agriculture.

Our population trajectory means that from now to 2030, the world will need to build the equivalent of a city of one million people in developing countries, every five days! There is widespread consensus that, going forward, farmers must produce more food per unit of land, water, and agrochemicals. To do so, however, they simply cannot continue producing in the same way. They will have to do this while

facing climate change, volatility, shifting nutrition needs, and the increasing scarcity of most of the physical factors of production. Agriculture is at the threshold of a necessary paradigm shift. Farming has enormous impacts on the world's most critical resources. Accordingly, farmers will have to produce while also ensuring the provision of various vital ecosystem services. If they do not, we will not only degrade those resources but also exhaust the ability to produce enough food. These expectations pose quite a challenge and the overall outcome depends very much on the response of millions of mostly small and medium farmers. The current "more production" orientation is so outdated and unresponsive to our current needs that it is causing its own problems, particularly for our environment and natural resources. Although food is critical, it is not just about food. We have a pressing need for new approaches in policies and structures that realistically account for the formidable environmental impacts and consider the social consequences of our evolving agrifood. Rather than simply "more" production, we must also consider what would be "better" production and better food systems. For the first time at a global level, food production faces multiple limiting factors for key resources such as land, water, energy and inputs. We must use this challenge to stimulate creative innovation (Giovannucci et al., 2012).^[25] The agriculture of a country is affected, in its general character and details of practice, by climate, the fertility of the soil, and the foods and habits of the people. Climate chiefly determines the plants to be cultivated and the order of the labours of the season, and modifies all the practices of the husbandman. Even with no great extremes of temperature, the practice of the farmer must be varied to suit the differences of the climate. To treat of Agriculture, therefore, as a practical art, without reference to some given conditions of climate and country, would embrace a wide range of observations and the consideration of a great mass of details. It would involve the examination of many opposite practices, in themselves perhaps good and adapted to the circumstances which gave rise to them, but, as a whole, unsuited to any one condition in which the farmer could be placed, and thence incapable of been reduced to practice. Those instructions in agriculture, therefore, may avail for useful purposes; they must have reference to a system applicable to some given condition of climate and country. For, however different be the natural productions of

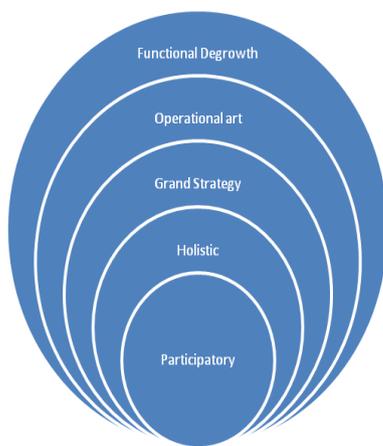
countries, and however necessary it be that the farmer adapt his operations to these differences, yet there are rules and maxims in the art common to the husbandry of all countries; And he who is thoroughly acquainted with one good system or practice applicable to any one situation of the farmer, has the means, by an easy analogy, of applying his knowledge to other and dissimilar cases. In describing a system of agriculture, too, is important that, while it is one which admits of being carried into easy effect, it shall be as perfect as, under the necessary condition, it can be rendered. A rude system of practice will not serve the purpose of useful example. Although the agriculturalist may not be able to reach in all things the model proposed to him, it is yet important that this model be good in itself so that his own practice may become as perfect as the circumstances in which he is placed will allow. Agriculture, like every art, is founded upon principles, and a natural method of studying it would be seemed to be, to begin with principles, and from these to deduce the rules of practice. The nature of the subject however or rather the state of our knowledge, admits of this course being followed only to a limited extent: for the art founded on experience is often better understood than the principles; And while the science is in some degree incomplete, the art has in many things been rendered very perfect by experience alone. Hence it is well to lay the foundation of the study of agriculture on knowledge of practice. In this case the agriculturalist, should he desire to extend the range of his observations to the relations of the sciences with practical art, will do so with a more useful result, and less hazard and error (Low, 1834).^[26]

In one of his monumental works, *Politica*, Aristotle wrote: *"The best state is the agricultural one, that is the one in which the many live by agriculture and animal husbandry"* highlighting its importance as a precursor of growth. This position is also confirmed by Xenophon referring to Aristotle, who in his *Oikonomikos* (VI: 17) and in the dialogue between Socrates and Isomachos notes that *"remarkable is the saying of the one who said that agriculture is the mother and nurse of all crafts. Because when agriculture thrives every other Art and Science prospers as well; whereas on the other hand, if the land by necessity is left barren, there fade away all other crafts in sea or land."* It is given that the agriculture recommend and exercised within Degrowth frame, can be applied by ordinary people

in everyday terms without excellent infrastructure, technologies or complex budgets. It is based in accepting that a cultivated field, park or garden, is not a simple sum of plants, soil, stones, etc., without reference to what surrounds them. It is a whole, whose parts are interrelated and interact with each other, but also with what surrounds them, and is ultimately always a part of nature. It is not simply a different philosophy; is a different perception of life without some excellent infrastructure, technologies or complex budgets and with decreased to zero low cost external inputs. Reijntjes et al. define Low External Input Sustainable Agriculture (LEISA) as *"agriculture which makes optimal use of locally available natural and human resources (such as soil, water, vegetation, local plants and animals, and human labor, knowledge and skills) and which is economically feasible, ecologically sound, culturally adapted and socially just. The use of external inputs is not excluded but is seen as complementary to the use of local resources and has to meet the above mentioned criteria"* (Najafabadi et al., 2012).^[27] So, it is impossible to be affected even hardly, by the vagaries of some "distant markets". It's time to get back to the fundamentals of agriculture, sustainable agriculture. In this sustainable mode, Pretty identifies a number of goals of sustainable agriculture, which include: (1) a more thorough incorporation of natural processes. (2) A reduction in the use of off-farm, external and non renewable resources. (3) More equitable access to resources. (4) Greater productive use of local knowledge and practices. (5) Greater self-reliance for farmers and rural populations. (6) A better match between production practices and climate and landscape. (7) Profitable and efficient production with an emphasis on conservation of the soil, water, energy and biological resources (Najafabadi et al., op-cit). The art of agriculture claims that technology and know-how although may have a position, it can operate without them and be independent with simple means. Several definitions in global perspective for Sustainable Agriculture exists: **Definition 1:** Agriculture is sustainable when it is ecologically sound, economically viable, socially just, culturally appropriate and based on a holistic scientific approach. (NGO, Sustainable Agriculture Treaty, 1992). **Definition 2:** Low-External-Input and Sustainable Agriculture (LEISA) is agriculture which makes optimal use of locally available natural and human resources (such as soil, water, vegetation, local

plants and animals, and human labour, knowledge and skill) and which is economically feasible, ecologically sound, culturally adapted and socially just. (Reijntjes, Haverkort and Waters-Bayer, *Farming for the Future* 1992). **Definition 3:** Sustainable development is the management and conservation of the natural resource base and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable. (Document CL 94/6 94th session of the FAO Council 1988, FAO 1994).^[28] Also Lewandowski et al., defined in 1999 sustainable agriculture as *"the management and utilization of the agricultural ecosystem in a way that maintains its biological diversity, productivity, regeneration capacity, vitality, and ability to function, so that it can fulfill – today and in the future – significant ecological, economic and social functions at the local, national and global levels and does not harm other ecosystems"* (Biala et al., 2008).^[29]

5.3 Functional Degrowth circle; matching degrowth dynamics, into farming practices.



Functional degrowth, the circle of wisdom, goes beyond responding to events we are rich in data but poor in information and becomes true releasing degrowth dynamics. Then its stakeholders (IK & agriculture art) are put and act together addressing mutually identified concerns (i.e. nutrient run off, nutrient loss through volatilization, the destruction

of beneficial microorganisms, insects, birds, reptiles, soil fertility, lack of irrigation water, etc). This matching concept includes resource-poor as well as resource-rich farmers, managing agricultural productivity while maintaining or improving the resource base. The cooperation of IK practices with the art of agriculture, rather than an emerging "technique" or initiating changes, is most, critical thinking which is opposed to "ready to use technological or technical packages". Technique originally comes from Greek and means skilled (technicos) which again comes from techne, which means art or craft. The term "indigenous knowledge" is used synonymously with "traditional" and "local knowledge". These traditional technologies are nothing but indigenous knowledge. By adopting such indigenous knowledge, our ancestors did not face any problem of large scale pest out break or economic crisis unlike the today's farmers. Indigenous practices with agriculture art are organic in nature. They do not cause any damage to the air, water and soil, are safe to the human beings and are free from causing environmental pollution. These practices are dynamic because they are region specific, depending upon soil type, rainfall, topography etc. and are often modified by the local farmers. But what's driving the loss of traditional knowledge? (1). Agricultural policies, subsidies and research that promote modern varieties and technologies at the expense of local knowledge and biodiversity. (2) Intellectual property rights that protect new varieties without equal protection of farmers' rights over traditional varieties, which means that farmers have no incentive to sustain traditional varieties. (3) Media promotion of modern varieties and foods, which influences consumer demand and reduces markets for traditional varieties. (4) Limited arable land and smaller landholdings, which can force communities to adopt high-yielding modern varieties. (5) Erosion of cultural values and customary rules, due to modernization, weakening of traditional authorities, out-migration and changes in occupation (Swiderska et al.).^[30] Paraphrasing Senanayake, to achieve the matching process, agriculture is connected with different knowledge of similar things; different knowledge of different things; different ways of organizing and applying such knowledge; different ways of preserving and transferring knowledge. Below are some indicative paradigms of heterogeneity of sources and strategies of lowest quality and cost that are used. Paradigms, by

evidence and results in practice, indicating that a full set of rules exists based on explicit and tacit knowledge hinged clearly: (1) Super efficient irrigation with buried clay pots: Buried clay pot irrigation was first described in an agricultural extension bulletin in China more than 2000 years ago. The Fan Sheng-chih Shu (the first agricultural extension book) describes the use of buried clay pot irrigation in China more than 2,000 years ago. It is likely that buried clay pot irrigation had been used for many decades or centuries before this description was published. Current practices remain much the same. "Make 530 pits per hectare (210 pits per acre), each pit 70 cm (24 inches) across and 12 cm (5 inches) deep. To each pit add 18 kilograms (38 lbs.) of manure. Mix the manure well with an equal amount of earth. Bury an earthen jar of 6 liters (1.5 gallons) capacity in the center of the pit. Let its mouth be level with the ground. Fill the jar with water. Plant 4 melon seeds around the jar. Cover the jar with a tile. Fill the jar to the brink when the water level falls". In addition to being more efficient than drip systems, buried clay pots can be used without pressurized, filtered water supplies. The clay pots can be made with locally available materials and skills and are less likely to be damaged by animals or clogged by insects than drip systems. The clay pot provides demand responsive irrigation at very high efficiency. Clay pot irrigation can be 5-10 times more efficient than conventional irrigation. It is being used more widely in Asia, Africa, Latin American and the US. (Bainbridge 2001)^[31]. (2) Multi-purpose and multi-functional liquid organic products: *Sanjivani* is a low/no cost organic liquid manure. Cow dung, cow urine and water are mixed in the ratio of 1: 1: 2 in an earthen pot or bucket and left aerobically (stirring twice daily) for 7-9 days. Stirring with a stick at least ten times is required every day morning and evening clockwise and anticlockwise. This is called mother solution of *Sanjivani*, used for seed enrichment to provide nutrients and growth promoting hormones during initial crop growth. Fermented solution may be applied in field with irrigation also; *Panchagavya*. In Sanskrit, *Panchagavya* means the blend of five products obtained from a cow. Mixing of five ingredients i.e. cow dung, cow urine, milk, curd and ghee in 5: 3: 2: 2: 1 and incubated for 7-9 days in an earthen pot or wide mouth plastic container. Stirring with a stick is required every day two times morning and evening clockwise and anticlockwise. It is stored in shady

place with cover. This promotes biological activities in the soil and makes nutrients available to crops. *Panchagavya* may be applied with irrigation water also without sieving; *Sasyagavya*, the ingredients in this case are: cow dung, cow urine, vegetable waste/crop residues and water. Initially, vegetable waste/crop residues are chopped. Then fresh cow dung, cow urine, chopped organic waste and water are mixed at 1: 1: 1: 2 ratios properly and allowed to ferment for 10-12 days aerobically (stirring twice in a day). It is used for drenching soil before sowing and /or after sowing with irrigation water; *Kunapajala*, Sanskrit word *kunapa* means smelling like dead body, stinking and *jala* means water. So *Kunapajala* means water smelling like a dead body. It contains mainly cow dung, cow urine, water, and any animal flesh like flesh part of fish, poultry birds or animals. Fresh cow dung, cow urine, animal waste and water are taken in a bucket at 1: 1: 1: 2 ratios and mixed properly. Then allow this mixture to ferment in a shady place for 25-30 days aerobically (stirring twice in a day). To remove the foul smell of the products, any scented leaves like lemon, lemongrass etc. or peels of lemon, orange, sweet orange etc. are to added 1-2 days before spray. Plants absorb through roots, leaves and stem the nutrients available in these liquid organic products. These promote biological activities in the soil also to make the nutrients available to crops. All these liquid organic products can be enriched with molasses/rice washed water, pulse powder, ripen fruits, yeast culture, etc (SALoKT project 2008-2011).^[32] On a "need basis" the matching process enhances collaboration in practice, by highlighting the various options available, and the issues involved in establishing and maintaining different coordination mechanisms. It is important to emphasize that there are no blueprints or off-the-shelf results to develop and maintain such collaboration. Obvious, is not a Procrustean bed but a long term goal and like communication is a two-way street. There is no "correct" answer – in fact engaging in the process may well be more important than any specific set of results. This perspective was put forth by Dwight D. Eisenhower who said, "*The plan is useless; it's the planning that's important.*" (Etkin and Davis 2007).^[33] As each context is unique, this circle of wisdom, can only offer advice, listing examples, manage applications and raise awareness of the issues involved, rather than give step-by-step instructions. The different approaches which rose

should be adapted to suit the needs, resources, and the specific situation in their particular context. Terms like coordination and collaboration have been used in a wide range of initiatives in different contexts. While it is important not to labour over these definitions, it should be recognized that coordination is often a controversial concept in any sector; some may resist coordination for fear of being controlled or overwhelmed by doubts and restrictions. Some interventions are rather straightforward, and the expected result is easily achieved and seen. Others, like the management of natural resources or the development of sustainable production systems, are very complex, can be slow and usually involve many different actors and processes. It is therefore necessary to have a flexible and reflective attitude, constantly re-evaluating what is being done and changing activities in order to achieve the intended objectives. It is important that these activities are documented so that the lessons learnt can be used to further improve the initiatives. If the results of such initiatives are written down and published, it becomes possible to share the information and for others to hear about the experiences and lessons learnt in a particular project. But documentation, in this context, refers to much more than just describing what was done or experienced. In order to generate new knowledge, the process must include a critical analysis of the information available as well as of the opinions, judgments or criticisms presented by all stakeholders and participants. Knowing that many different people have been involved with a project and that each one of them will have different viewpoints and interests, it is logical to expect that there will be different opinions regarding what was done and achieved. Rather than aiming to achieve consensus, it will be easier to identify lessons learned, and generate knowledge, if this diversity of opinions is taken into account and is fully represented. This is linked to the basic principle of participation.(Tafurop-cit). Functional degrowth circle, applied as a stand-alone process, identifies whether complete pathways exist linking development and implementation of rules, policies, procedures and materials for the purpose of avoiding reduction of critical natural resources.

Conclusion

The identification of degrowth streams was first developed by Flipo. Following him we refer to the

streams as degrowth 'sources'. Degrowth is placed at the junction of several such sources or streams of thought which cross each other without being in competition (Schneider et al., op-cit). Functional degrowth, the matching circle, has the power to release degrowth dynamics. As a junction point of Degrowth sources or streams of thought, which cross each other without being in competition, it is a creek within the stream of Bioeconomics. Keyword, derived from the two words; Bio and Economy. Then Economy, derived from *οἶκος* house, (*our planet*), and *νόμος*, (*law*). All are conceptualized values and principles. Bio (*life*), the dynamic mechanism facilitates fulfillment of objectives. Our planet (*οἶκος*) being in critical juncture, warns us with a chain of events, indicating that crisis is not outside our backyard, but in it. *Law*, states the procedures for understanding the legal or ethical requirements which are needed to safeguard our home (planet) against lack of preplanning. *Life* and *law* are linked to each other within our *οἶκος* boundaries, creating a complex co-dependency. Acting for degrowth transition as main players, it contributes towards the establishment of interpersonal rather than individualistic relationships. Thus degrowth is not just a quantitative question of producing and consuming less, but a tool proposed for initiating a more radical break with dominant economic thinking (Fournier 2008)^[34]. If any datum within this paper could be considered to be an axiom and of senior importance to anything else, this would be it: It is the interdependency and mutual beneficial actions of the various degrowth dynamics which make it possible to establish themselves (the dynamics) within any environment and motivate the already-existing Degrowth sources or streams in a beneficial and regenerative direction to an economy of permanence (Kumarappa, 1945)^[35].

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