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Sustainability thoughts 197: How to transform and apply the general structural falsification theorem to the deep environmentalism based development model? What are the implications of doing this?

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Abstract: Any framework based on unilateral maximization is structurally falsified whenever the system it represents is inherently conjunctural (K = L). And this means that development frameworks based on unilateral maximization under independent assumptions such as for example the traditional economic development framework or deep economic model (DE = B), the red Marxism framework or deep socialism (DS = A), the deep environmentalism or the environment only framework (ENV = C) and so on can be structurally falsified whenever the system's component that drives them is shown to be inherent conjunctural, which means that the maximization of this system breaks conjunctural equality. This framework has already been adapted to invalidate on structural grounds both traditional sustainable development thinking a la Adam Smith and red socialism based development thinking a la Karl Marx.

This paper also starts from a simple but often overlooked observation: in practice, social, economic, and environmental outcomes are empirically interdependent. Changes in one dimension systematically affect the others, indicating that these components are not separable but co-determined. However, most deep development frameworks—whether associated with Adam Smith, Karl Marx, or environment-only approaches—are structurally formulated as if these dimensions were separable, either by assuming externality neutrality or by treating interdependencies as secondary adjustments. This creates a mismatch between how reality behaves and how it is modeled. The analysis that follows formalizes this mismatch: it shows that when inherently interdependent (conjunctural) systems are treated through additive, separable structures, structural inconsistencies necessarily emerge, and these inconsistencies manifest as sustainability gaps. The purpose of this paper is to make this structural issue explicit and to demonstrate, through the general structural falsification theorem and its application, how frameworks like the deep environmentalism or the environment-only development framework can be invalidated on structural grounds before empirical testing knowing they work on non-market-based separability, which allows them treat economic and social issues as externality tradeoffs that can be administered as needed. In other words, in this case the aim is to link empirical interdependence to conjunctural structure to incompatibility with unilateral maximization as deep environmentalism: assumes environmental primacy and separability when empirical reality shows social, economic, and environmental codependence.

Relevant concepts within the text: Structural falsification, Maximization, Optimization, Independent components, Codependent components, Externality neutrality assumptions, No externality neutrality assumptions, Sustainability gaps, General structural falsification theorems, General structural validation theorems, deep environmentalism based development falsification theorems, deep environmentalism based development optimization inconsistency theorem

Introduction

Karl Popper held the view that valid paradigms can be refuted by future observation and/or experiment(Popper 1965) to ensure the growth of scientific knowledge taking those valid paradigms as paradigms without structural inconsistencies that can generate predictions that can be tested in future events, however if a valid paradigm contains structural inefficiencies, then the negative impacts and accumulation of negative impacts driven by those structural inefficiencies should be expected and predicted to later in the future to corroborate themselves, leading to the world of structural falsification. These structural inconsistencies generate sustainability gaps that drive paradigm death, shift and paradigm evolution (Muñoz 2019a). Then Thomas Kuhn gave us the scientific paradigm evolution loop(Kuhn 1970) governing how new ideas that address the weaknesses of old ideas after consensus for change take over as the new status quo paradigm, however Kuhn's ideas are not made from the point of view of the need for conjunctural paradigm evolution as old non-conjunctural ideas with structural embedded inefficiencies in them cannot be fixed from the inside, only managed; and when we think or assume that we can treat conjunctural problems as additive problems then we fall into the critical problem-solving impossibility zone as the case of the 1987 sustainable development idea

shows (Muñoz 2025a) as the critical socio-environmental problems have continue to expand despite a world under sustainable development thinking and goals since then(1987-2026).

As Popper and Kuhn apparently placed their focus on the growth of scientific knowledge that comes from falsifying and evolving non-conjunctural ways of thinking, then they missed the possibility of structural falsification and validation and possibility conjunctural paradigm shifts as the full fixed for the structural inefficiencies embedded in non-conjunctural systems, for example when you move from non-conjunctural thinking to conjunctural thinking then the knowledge base of non-conjunctural thinking no longer works as in the case where a move to true sustainability thinking leaves icons like the arrow impossibility theorem behind (Muñoz 2016a). This means that a link is missing and has been missing since the work of Popper in 1965 and Kuhn in 1970, which is structural falsification and the conjunctural paradigm evolution thought that goes with it as for example the shift from traditional market thinking/non-conjunctural thinking to true sustainability thinking/fully conjunctural thinking requires the fixing of the structural abnormalities embedded in traditional markets through cost internalization to shift it to true sustainability thinking, step by step or in one step (Muñoz 2025b) since only conjunctural thinking works under true sustainability(Muñoz 2026a). In other words, structural paradigm or model validations are placed before testing. This paper is focused on the application of the same general structural falsification theorem used to falsify the traditional economic thinking of Adam Smith (Smith 1776) and the red socialism thinking of Karl Marx (Marx and Engels 1848) on structural grounds to structurally falsify this time the deep environmentalism or environment only based development model on similar structural flaw grounds.

Goals of this paper

1) To share the summary application of the general structural falsification theorem as a guide;
2) To transform it into the summary application of the deep environmentalism based development structural falsification theorem; 3) To expand the summary application of the deep environmentalism based development structural falsification theorem into the general deep environmentalism based development falsification theorem step by step; and 4) To stress in the process how the deep environmentalism based development structural falsification theorem works.

Key operators and concepts

1) Optimization = *, *a joint operator process that fails under non-conjunctural assumptions or conditions.*
2) Maximization = MAX, *a unilateral operator process that breaks conjunctural systems*
3) Structural flaw, *the presence of abnormalities in the structure of the system or a system with abnormalities embedded in it.*
4) Structural consistency, *the absence of abnormalities in the structure of the system or a system without abnormalities embedded in it.*
4) Structural falsification, *the refutation of theories solely on the basis that they are not valid theories structurally, and therefore, this structural flaw invalidates them using maximization operators and optimization operators.*
5) Structural validation, *the verification of theories solely on the basis that they are valid theories structurally, and therefore, this structural consistency validates them using maximization operators and optimization operators.*
6) Truly conjunctural systems, *the ones with structural consistency.*
7) Distorted conjunctural systems, *conjunctural systems with inconsistencies.*
8) Truly independent systems, *the ones where there is component separability or independence.*
9) Distorted independent systems, *the ones where there is distorted component separability or independence.*
10) Non-distorted independent systems, *the ones where there is truly no distorted component separability or independence in reality or by assumption.*
11) Red socialism, *the society only development model.*
12) Capitalism, *the economy only development model.*
13) Deep environmentalism, *the environment only development model.*

The general structural paradigm falsification theorem

The ideas of the existence of the structural paradigm falsification tools based on maximizing and optimizing inherently conjunctural systems such as K = L was recently shared (Muñoz 2026b; Muñoz 2026c), where maximization breaks the conjuncturally balanced equality so that then $K \neq L$ as K and L are here codependent components , not independent ones, and this leads to the creation of sustainability gaps due to maximization driven distortions; and later this idea was used to structurally invalidate both the traditional economic development model of Adam Smith (Muñoz 2026b) and the red socialism model of Karl

Marx(Muñoz 2026c) which are both inherently a conjunctural type system with structures D = B and M = A, respectively and where D = traditional economic development and B = the traditional economy, M = red socialism based development, and A = the social economy, and here when we maximize for example economic activity MAX(B) or social activity MAX(A), then the balanced equality in both cases breaks so that $D \neq B$ as D and B are codependent component and $M \neq A$, not independent ones so that socio-environmental sustainability gaps are created due to maximization induced distortions in one case and eco-economic sustainability gaps are created due to maximization induced distortions in the second case.

Summary application of the general structural falsification theorem can be formally stated as follows:

If we have an inherently conjunctural development system such as K = L, where K and L are codependent components, not independent ones, then:

If development K is pursued through the factor L-only model, then:

(1) Under maximization behavior:

L is maximized independently

Which implies?

$\mathbf{K \neq L}$

(2) Structural implication

The equality K = L is broken,

Therefore:

Development type K, as defined within L - only framework, is structurally falsified.

(3) Gap interpretation

The resulting gap:

$\mathbf{|K - L| > 0}$

Represents:

--Ignored costs or cost externalization

And this explains the emergence of sustainability gaps or distortions gaps under non-conjunctural development thinking.

(4) Two-lines conclusion

Development type K cannot be validly represented or achieved within an L-only maximization framework without structural falsification. In other words, when a conjunctural reality ($K \leftrightarrow L$) is modeled as a separable system ($K \rightarrow L$) or ($K \leftarrow L$), any maximization or optimization procedure will generate structural inconsistency.

Implication 1:

A theory such that K = L can be invalid before testing, due to internal structure. And if an invalid theory such as K = L is tested through maximization and/or optimization it can be shown to be structurally falsifiable, and the nature of the sustainability gaps created by such a theory is explained; and then the need for the correction of those sustainability gaps or the existence of conjunctural paradigm shift avoidance behavior can be amplified or called for to allow for the growth of science based knowledge and practice.

Implication 2

There is structural inconsistency across all non-conjunctural frameworks or assumed conjunctural frameworks when they are not such as the framework K = L, and therefore when tested, all non-conjunctural systems or conjunctural systems by assumption such as K = L fail structurally. As an example in practice, if social, economic, and environmental outcomes are empirically interdependent, then any model that treats them as separable components is structurally mis-specified, regardless of whether externalities are assumed away or internalized, and that includes model K = L under separability.

The Thomas Kuhn's on structurally flawed or structurally inconsistent paradigms

Keeping in mind, that structurally flawed paradigms have embedded abnormalities which sooner or later will tend towards full unsustainability as pressures from the expansions of these structural flaws or sustainability gaps will drive them to that full unsustainability point and the only way they will keep their core paradigm values is if they follow vertical paradigm evolution routes available before collapse; otherwise they will be subjected to paradigm death and flip or paradigm death and flip-back depending on the origin of the structurally

flawed paradigm reflecting the Thomas Kuhn's curse for structurally flawed paradigms in terms of science based paradigm evolution.

Summary application of the general theorem to the deep environmentalism based development model

If we have an inherently conjunctural development system such as E = C, where E = Deep environmentalism based development and C = environment, where E and C are codependent components, not independent ones, then:

If development E is pursued through the factor C-only model, then:

(1) Under maximization behavior:

E is maximized independently

Which implies?

$\mathbf{E \neq C}$

(2) Structural implication

The equality E = C is broken,

Therefore:

Development type E or deep environmentalism, as defined within C= environment - only framework, is structurally falsified.

(3) Gap interpretation

The resulting gap:

$\mathbf{|E - C| > 0}$

Represents:

--Ignored economic and social costs or socio-economic cost externalization

And this explains the emergence of sustainability gaps or distortions gaps under non-conjunctural development thinking such as socio-economic sustainability gaps.

(4) Two-lines conclusion

Development type E or deep environmentalism based development cannot be validly represented or achieved within a C = environment-only maximization framework without structural falsification. In other words, when a conjunctural reality (E ↔ C) is modeled as a separable system (E → C) or (E ← C), any maximization or optimization procedure will generate structural inconsistency.

Implication 3:

A theory such that E = C can be invalid before testing, due to internal structure. And if an invalid theory such as E = C is tested through maximization and/or optimization it can be shown to be structurally falsifiable, and the nature of the sustainability gaps created by such a theory such as socio-economic sustainability gaps is explained; and then the need for the correction of those sustainability gaps or the existence of conjunctural paradigm shift avoidance behavior can be amplified or called for to allow for the growth of science based knowledge and practice.

Implication 4

There is structural inconsistency across all non-conjunctural frameworks or assumed conjunctural frameworks when they are not such as the framework E = C, and therefore when tested, all non-conjunctural systems or conjunctural systems by assumption such as E = C fail structurally.

Summary of general food for thoughts

1) In terms of policy implication

Models at play that are based on unilateral maximization applied to an inherently conjunctural system such as K = L will tend to underestimate feedback effects and generate policy resistance even as unintended consequences pile up as these negative consequences are not expected since a distorted paradigm has been assumed to be a valid paradigm.

2) In terms of sustainability implication

Model gains in systems such as K = L lead to distortions, which lead to rebound pressures, which undermine the model goals themselves and accumulate unsustainability.

3) In terms of paradigm implications a la Thomas Kuhn

A model such as K = L is not just empirically incomplete—it is structurally unstable and therefore subject to inevitable paradigm pressure. And these pressures push this model towards vertical paradigm evolution a la Thomas Kuhn if saving its core responsibility value is the aim or they push this model towards horizontal paradigm evolution where it loses its core responsibility value.

4) In terms of paradigm testing implications a la Karl Popper

A model such as K = L is then a paradigm which known structural flaws, which allows us to predict the coming of crises based on these specific structural flaws before testing, which can then be tested by observation and/or experiment a la Karl Popper to corroborate the negative impact associated with those structural flaws, but since the practice has been to test any theory without a structural consistency test first this has created the possible paradigm testing inconsistency principle affecting a world that is focused on empirical testing only.

5) In terms of the paradigm testing inconsistency principle

A condition in which a model such as K = L is empirically tested using methods that are not structurally consistent with the nature of the system the model represents, leading to misleading or delayed falsification.

6) One-line conclusion

These implications above are not model-specific; they are structural consequences of applying unilateral reasoning to inherently conjunctural systems.

Constructing the Deep Environmentalism Based Development Structural Falsification Theorem
The theorem building process

Let's assume that K = E = deep environmentalism based development and L = C = Environment-only model so now the system has the following conjunctural structural condition:

E = C

Where E and C are the codependent components that define the integral structure of the system. Please, notice that this is a balance condition — a conjunctural equality. It tells us the system is in a state where two components are co-determined

1) The conjunctural consistency requirement

A deep environmentalism based development method is structurally valid if and only if: it preserves or restores the requirement E = C through joint adjustments of E and C.

2) The structural falsification requirement

A deep environmentalism based development method is structurally falsified if: It imposes unilateral change (e.g., maximization) on E or C such that $E \neq C$, thereby violating the defining conjunctural requirement.

3) The necessary Outcome of Falsification

If $E \neq C$, then: a structural gap necessarily emerges, defined by $|E - C| > 0$ or by $|C - E| > 0$, depending on where the unilateral change is applied indicating system distortion or sustainability gap (SG).

4) The expected overall result

Therefore: Any deep environmentalism based development framework relying on unilateral maximization is structurally falsified whenever the system it represents is inherently conjunctural (E = C).

5) Elucidation

You can optimize a conjunctural deep environmentalism based development system, but you cannot maximize within it without structurally falsifying it. Notice in the method described above E = C before falsification there is structural admissibility, whether the deep environmentalism based development paradigm structure is valid or not. If valid the deep environmentalism based development paradigm is structurally consistent, and if invalid the deep environmentalism based development paradigm is structurally flawed. If the deep environmentalism based development paradigm is invalid, but it is assumed valid it is structurally flawed as in reality it has socio-economic abnormalities embedded in it. As a practical example consistent with the discussion above, if social, economic, and environmental outcomes are empirically interdependent, then any model that treats them as separable components including the deep environmentalism based development model is structurally mis-specified, regardless of whether externalities are assumed away or internalized, and this is the case in practice when socio-economic issues are treated as separate or external or non-limiting issues when

assumed away or not in the case of deep development thinking or the environment only based development models which assume environment supremacy and socio-economic component separability.

6) The maximization paradigm inconsistency and demonstration

Maximization is at the heart of additive deep environmentalism based development thinking, let's pick side C, then we treat E as a constraint or left over and what we see in this case is that the equality breaks analytically when we maximize C as C is maximized subject E. Therefore, the system is no longer E = C as maximizing C while holding E as fixed or adjustable term leads to losing the conjunctural balance and to transforming the system into a directional system or one sided pressure system; and since C increases without jointly adjusting E, then a distortion gap or sustainability gap is created ($|E - C| > 0$).

Implication 5:

Maximization is a special case of deep environmentalism based development system distortion, not a neutral analytical tool as its application leads to the breaking of the balance E = C creating distortions gaps or sustainability gaps. Hence, maximization of C breaks or distorts E = C balance as maximization breaks conjunctural systems.

7) The optimization paradigm consistency and demonstration

Optimization in the conjunctural sense reflects the joint determination of E and C as it aims at seeking a best configuration of the system as a whole; and therefore when the equality is optimized[$(E = C)^*$] the equality is maintained or rebalanced($E^* = C^*$), and this means that optimization is not a directional process as it seeks the best combination (E,C) such that the system works best given their interdependence, which leads to no distortion gaps or sustainability gap creation since [$(|E - C|) = (|E - C|)^* = (|E^* - C^*| = 0$]. Therefore, the result of optimizing a conjunctural equality such as E = C is that the system remain coherent as there is component and system optimality consistency ($S = (E = C)^* = E^* = C^*$, adjustments are mutual, not unidirectional, and balance equality is maintained as systems expand or contract.

Implication 6:

Optimization is a special case of non-distorted system or true conjunctural systems, a neutral analytical tool as its application leads to maintaining the balance E = C without creating distortions gaps or sustainability gaps. Hence, optimization of the non-distorted conjunctural system preservers or restores E = C balance; and this means that optimization fails in non-conjunctural systems and in distorted conjunctural systems.

8) Comparing the nature of structural falsification-structural validation

The implications of comparing the nature of structural falsification and structural validation in the case of the deep environmentalism model (E = C) are summarized in the table below:

Table 1

Maximization → creates divergence: **$E \neq C$** And this is the requirement for structural falsification
Optimization → manages convergence: **$E \leftrightarrow C$** And this is the requirement for structural validation
The comparison points out the gap-generating mechanism at play when maximizing goals and a gap fixing or elimination mechanism at work when optimizing goals.

We can see in table 1 above that while maximization creates distortions in the conjunctural system E = C or sustainability gaps optimization eliminates distortions or sustainability gaps in E = C. The relevant implications of Table 1 above are: 1) with respect to maximization: the environmental component C grows = C↑, the component E deteriorates $E \neq C$, and an socio-economic gap emerges = socio-economic sustainability gap; and 2) with respect to optimization: the component E and C cannot be jointly optimize (*) as E and C are independent in standard deep environmental thinking so that $(E = C)^* \neq E^* = C^* = S$, and hence, independent components cannot be optimized in ways that satisfy system optimality consistent requirements (S), and therefore a socio-economic gap emerges = socio-economic sustainability gap.

9) The general structural falsification theorem through maximization in the case of non-conjunctural deep environmentalism based development systems

You cannot maximize (MAX) a method that is inherently conjunctural without leaving E = C as if you MAX (C) subject to E or if you MAX (E) subject to C or when you maximize them separately, then $E \neq C$ and structural gaps or sustainability gaps are created since then $|MAX(E) - C| > 0$ and $|E - MAX(C)| > 0$, and therefore, that method is structurally falsified through maximization as balanced equality is broken. And therefore, deep environmentalism based development is linked to the creation and expansion of socio-economic sustainability gaps, which when approaching unsustainability under win-win situations or not, it leads to paradigm evolution (Muñoz 2019a) such as paradigm death (Muñoz 2016b) and/or paradigm flip backs (Muñoz 2019b).

Implication 7:

If the system's component that drives them is shown to be inherently conjunctural this means that the maximization of this system breaks conjunctural equality, and structural falsification occurs. In other words, you can optimize within E = C, but you cannot maximize without leaving E = C. As market maximization is based on the idea of independent choices and so the maximization of independent choices leads to the creation of sustainability gaps and their expansions, and therefore it is structurally invalidated by maximization as it has a structural inefficiency embedded in its pricing mechanism.

10) The structural validation theorem through optimization in the case of conjunctural deep environmentalism based development systems

You can optimize (*) a method that is inherently conjunctural without leaving E= C as if you optimize E and C jointly [(E=C)*], then method optimality consistency exist and no sustainability gaps are created since $|E^* - C^*| = 0$, and therefore, that method is structurally validated. However, as deep environmentalism based development or society only model is based on the core value of component independence or separability, it cannot be jointly optimized, again creating expanding sustainability gap pressures or expanding socio-economic gap pressures, and hence, it is also structurally invalidated by optimization as it has structural optimality inefficiency embedded in it.

Implication 8:

If the system's component that drives them is shown to be inherent conjunctural this means that the optimization of this system keeps conjunctural equality. In other words, if you can optimize within E = C, then structural validation exist, but you cannot maximize without leaving E = C. And therefore, if deep environmentalism thinking was based on conjunctural thinking it would be validated here, but since it is not, then it cannot be optimized in ways that meets system consistency optimality requirements (S), and therefore, failure to be validated through optimization is another way of structural falsification in the case of the deep environmentalism based development thinking.

11) The general structural falsification theorem through optimization in the case of deep environmentalism based development systems

If you have a system E = C that is not inherently conjunctural, and hence it is a system that has component independency and component fixing properties or it is assumed to have component independency and component fixing properties to allow for the method to work, as deep environmental thinking does or implies, that method cannot be optimized in a way that results in system consistent optimality conditions [S = (E = C)*] so that $E = C \neq S = (E = C)^*$, and this optimality inconsistency leads to the creation of structural gaps or sustainability gaps since then $|E - C| > 0 = E^* - C^* = 0$ and $|C - E| > 0 = C^* - E^* = 0$; and therefore, that method is structurally falsified through optimization as balance equality is violated.

Implication 9:

If the system's component that drives them is shown not to be inherent conjunctural or it is independent, then maximization can take place but not in ways consistent with system optimality consistency (S), which means that the maximization of this system breaks conjunctural equality as the system cannot be maximized without leaving E = C, and hence, it is structurally invalidated.

The Thomas Kuhn's on structurally flawed or structurally inconsistent red socialism based development paradigms

Keeping in mind, that structurally flawed deep environmentalism based development paradigms have embedded socio-economic abnormalities which sooner or later will tend towards full unsustainability as

pressures from the expansions of these socio-economic structural flaws or socio-economic sustainability gaps will drive them to that full unsustainability point and the only way they will keep their core paradigm values of environmental responsibility is if deep environmentalism based development paradigms follow vertical paradigm evolution routes available before collapse; otherwise they will be subjected to paradigm death and flip or paradigm death and flip-back depending on the origin of the structurally flawed the deep environmentalism reflecting the Thomas Kuhn's curse for structurally flawed deep environmentalism paradigms in terms of science based paradigm evolution. It has been pointed out recently that deep environmentalism or deep ecology thinking when approaching full unsustainability has the routes of vertical paradigm evolution or of horizontal paradigm evolution (Muñoz 2026d), the first option if available keeps the core values of deep environmentalism of environmental responsibility in the higher level paradigm and the second option leads to the lost of the core values of deep environmentalism in terms of environmental responsibility as it follows horizontal paradigm evolution(Muñoz 2025c).

Summary of specific food for thoughts

1) In terms of policy implication

Deep environmental models at play that are based on unilateral maximization applied to an inherently conjunctural system such as E = C will tend to underestimate feedback effects and generate policy resistance even as unintended socio-economic consequences pile up as these negative consequences are not expected since a distorted deep environmental paradigm has been assumed to be a valid paradigm.

2) In terms of sustainability implication

The deep environmental model gains in systems such as E = C lead to socio-economic distortions, which lead to rebound pressures, which undermine the model goals themselves and accumulate unsustainability.

3) In terms of paradigm implications a la Thomas Kuhn

A deep environmentalism model such as E = C is not just empirically incomplete—it is structurally unstable in socio-economic terms and therefore subject to inevitable paradigm pressure. And these socio-economic pressures push this model towards vertical paradigm evolution a la Thomas Kuhn if saving its core value of environmental responsibility is the aim or they push this model towards horizontal paradigm evolution where it loses its core environmental responsibility value.

4) In terms of paradigm testing implications a la Karl Popper

A deep environmentalism model such as E = C is then a paradigm with known socio-economic structural flaws, which allows us to predict the coming of socio-economic crises based on these specific structural flaws before testing, which can then be tested by observation and/or experiment a la Karl Popper to corroborate the negative impact associated with those socio-economic structural flaws, but since the practice has been to test any theory without a structural consistency test first this has created the possible paradigm testing inconsistency principle affecting a world that is focused on empirical testing only.

5) In terms of the paradigm testing inconsistency principle

A condition in which a deep environmentalism model such as E = C is empirically tested using methods that are not structurally consistent with the nature of the system the model represents, leading to misleading or delayed falsification.

6) One-line conclusion

These implications above are not deep environmentalism model-specific; they are structural consequences of applying unilateral reasoning to inherently conjunctural systems so they apply for example to the deep economy model D = B of Adam Smith and to the deep red socialism model M = A of Karl Marx.

Conclusion

The deep environmentalism based development structural falsification theorem was built step by step based on the same general structural falsification theorem used to falsify both the traditional economic development model of Adam Smith and the red socialism model of Karl Marx on structural flaws grounds. It indicates that both maximization and optimization procedures can be used to show that conjunctural development systems cannot be handled without creating sustainability gaps as the maximization process breaks the balance between conjunctural components such as E = C and as the optimization process shows that separability in deep environmentalism based development systems leads to system optimality inconsistencies, and hence it generate sustainability gap creation and expansion problems in the form of socio-economic

sustainability gaps. It was shown that optimization can be used to structural falsify non-conjunctural development structures since they cannot be optimized in ways that respect the system consistency optimality requirements, including non-conjunctural deep environmentalism based structures assumed to be conjunctural structures under socio-economic externality production neutrality assumptions or socio-economic component fixation assumptions. Specifically, it was pointed out that maximization leads to the breaking of the conjunctural system $E = C$, so that $E \neq C$ leads to socio-economic sustainability gap creation of the form $|E - C| > 0$; and hence, deep environmentalism based development E depending solely on the maximization of C cannot be validly stated without structural falsifying itself. Only conjunctural deep environmentally based systems can be structurally validated through maximization and optimization as in both cases conjunctural balance is maintained while all non-conjunctural deep environmentalism based development systems can be structurally falsified through maximization and optimization. Hence, in reality social, economic, and environmental components are codependent, but deep environmentalism thinking assumes environmental primacy and component separability, then this mismatch with reality leads to structural inconsistency and the creation of socio-environmental sustainability gaps and their expansion as deep environmentally based development expands.

In summary, what these deep environmentalism based development theorems change is the non-structural view of deep environmentalism based development paradigm falsification a la Karl Popper and the non-structural view of deep environmentalism based paradigm evolution a la Thomas Kuhn as now both falsification and vertical paradigm evolution for distorted deep environmentalism based development systems are both structural, These theorems invalidate using maximization and optimization thinking that you can maximize and optimize component independent based deep environmentalism based development systems in ways consistent with system consistent optimality requirements. These theorems show that you cannot invalidate or falsify non-distorted conjunctural deep environmentally based development systems using maximization and optimization thinking as conjunctural equality remains balanced, at the point where the maximum deep environmentalism based development is the minimum optimal environmental balance, and at the point of optimal environmental development system consistency respectively. However, these theorems show that you can invalidate or falsify distorted conjunctural deep environmentalism based development systems. Hence, these deep environmentalism based development theorems open the door to look at deep environmentalism based development thinking from the embedded structural inconsistent point of view instead of the standard non-conjunctural view. And finally, it was indicated that when deep environmentalism based development models approach the point of full unsustainability they have two routes to follow, to evolve vertically and keep the core value of environmental responsibility or evolve horizontally and lose its core value of environmental responsibility. In general it can be said that deep environmentalism does not fail because it prioritizes the environment, but because it attempts to do so within a structurally separable framework in a world that is inherently conjunctural in environmental, social and economic terms.

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