Sustainability Thought 200: From linear pollution markets to circular pollution markets: Pointing out the third major blunder in terms of development thinking and critical socio-environmental problem solving https://doi.org/10.5281/zenodo.15786267

By

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Abstract

This author believes that there have been three clear major development thinking blunders since 1987 when trying to address the socio-environmental consequences of living under socio-environmentally distorted traditional market thinking since 1776 when the world endorsed and promoted Adam Smith's ideas while the distortions embedded in that market creating the sustainability problem remain still active, one after the other: 1) First in 1987, the Brundtland Commission had a choice, to recommend a fix through sustainability market based solutions or to recommend a patch through sustainable development solutions to the critical socio-environmental problem they were dealing with; and they chose a patch; 2) In 2012 Rio + 20, the Brundtland Commission on Sustainable Development had a choice, to implement an environmental fix through green market-based solutions or to recommend a patch through dwarf green market-based solutions to the critical environmental problem they were addressing; and they chose a patch; and 3) In 2023 the world had again a choice, to finally internalize socio-environmental externalities to fix the pollution production problem in the linear traditional market and make it circular or to ignore the problem and move from traditional linear pollution production markets to traditional circular pollution production markets assuming again socio-environmental price distortion neutrality, and hence, leaving the root cause of the pollution generation problem embedded in both linear and circular pollution production markets untouched; and they chose to go circular economy thinking as a pretend patch. They are considered blunders because all those choices made since 1987 to address sustainability problems violate the theory-practice consistency principle and as well as the expectations of the Thomas Kuhn's paradigm evolution loop under academic integrity. This paper focuses on the third development thinking blunder, the choosing of circular traditional pollution markets over linear traditional pollution production markets formally to since about 2023 mostly in Europe to address the critical socio-environmental problem they create without addressing the root-cause of the pollution production problem, the socially and environmentally distorted traditional market prices. In other words, the circular economy fixes the resource use inefficiencies of the linear economy instead of fixing the socio-environmental pollution problem associated with the linear model, the problem we have been trying to solve since 1987, and which is a problem still embedded in the traditional circular economy. The first and the second development thinking blunders have been recently highlighted in detail.

Key concepts

Sustainability, sustainable development, sustainability gap, traditional market, sustainability problem, sustainable development problem, theory-practice consistency principle, social sustainability problem, environmental sustainability problem, socio-environmental sustainability problem, paradigm fix, paradigm patch, linear traditional market, circular traditional market, pollution production market, pollution management market.

Introduction

a) Recent development thinking blunders

It can be said that dealing with the socio-environmental consequences created by the socio-environmentally distorted traditional market thinking since 1776 when the world endorsed and promoted Adam Smith's ideas (Smith, 1776) there have been according to this author three clear major development thinking blunders when trying to deal with those market distortions while the distortion problem remains active, one after the other: 1) First in 1987, the Brundtland Commission had a choice, to recommend a fix through sustainability market based solutions such as a full sustainability fix (Muñoz 2020) or to recommend a patch through sustainable development solutions to the critical socio-environmental problem created by the distorted market they were dealing with; and they chose a patch a la sustainable development(WCED 1987; Trzyna 1995; UN 2001; UN 2007); 2) In 2012 Rio + 20, the United Nations Commission on Sustainable Development (UNCSD) had a choice, to implement an environmental fix through green market-based solutions and thinking (Muñoz 2016);) or to recommend a patch through dwarf green market-based solutions to the critical environmental problem they were addressing created by distorted traditional market pricing; and they chose a patch despite indicating otherwise (UNCSD 2012a; UNCSD 2012b); and 3) In 2023 the world had again a choice, to finally internalize socio-environmental externalities to fix the pollution production problem embedded in the linear traditional market and make it circular or to move from traditional linear pollution production markets to traditional circular pollution production markets assuming again socio-environmental price distortion neutrality, and hence, leaving the root cause of the pollution generation problem embedded in both linear and circular pollution production markets untouched (Muñoz 2024a); and they chose to go circular economy thinking as a pretend patch (OECD 2018; WB 2022; EEA 2023a; OECD 2024; OECD 2025).

Notice that the Brundtland Commission in 1987 (WCED 1987) found a socio-environmental pollution production problem associated with working of the traditional market, not an inefficient use of resources; and see that the United Nations Commission on Sustainable development (UNCSD 2012a; UNCSD 2012b) as well documented in 2012 an environmental pollution production problem associated with the traditional market, not an inefficient use of resources, and therefore, none of them found that the problem generating pollution embedded in the traditional market was an inefficient use of resources. Hence, the chosen development recommendations mentioned above made starting in 1987, going sustainable development, going dwarf green markets, and going circular economy thinking, they are all considered development

thinking blunders because all those development choices made to address critical sustainability problems violate the theory-practice consistency principle (Muñoz 2009) as they do not match the nature of the problem and as well as violating the expectations of the Thomas Kuhn's paradigm evolution loop under academic integrity (Muñoz 2022) as they do not fully remove the abnormalities creating the sustainability problem.

The nature and implication of the first development thinking blunder (Muñoz 2025a), choosing sustainable development over sustainability to address a socio-environmental sustainability problem, and of the second development thinking blunder (Muñoz 2025b), the choosing of dwarf green markets over green markets, have been recently shared in detail,

b) Ignoring the environmental sustainability problem to go from a linear pollution production problem to circular pollution production

This paper focuses on the third development thinking blunder, the choosing of circular traditional pollution markets over linear traditional pollution production markets formally since about 2023 mostly in Europe, geared not to address the critical socio-environmental sustainability problem traditional markets create and which we have been trying to fix since 1987, but to address the problems of resource use inefficiency under which the traditional market works as they are environmentally distorted markets, a move done without addressing the root-cause of the pollution production problem, the socially and environmentally distorted traditional market prices like if they did not know that the Brundtland Commission (WCED 1987) has been trying to fix such a problem through sustainable development means and the United Nations Commission on Sustainable Development(UNCSD 2012a; UNCSD 2012b) has been addressing since 2012 through dwarf green market means. Figure 1 below shows the structure of the move from linear traditional market thinking to circular traditional market thinking shared recently (Muñoz 2024) where decision makers and researchers started to promote traditional circular economic thinking in 2023 to correct the inefficient use of resources problem created by linear economic thinking while abandoning the need to fix the environmental pollution production problem associated with linear economic thinking, a concern that has guided development 1987-2023, reflecting that ideas on traditional economic circularity are inconsistent with the need to eliminate, not assumed away, environmental distortions as it was assumed under linear thinking a la Adam Smith as we know now those distortions are real and need to be accounted for (Muñoz 2024):

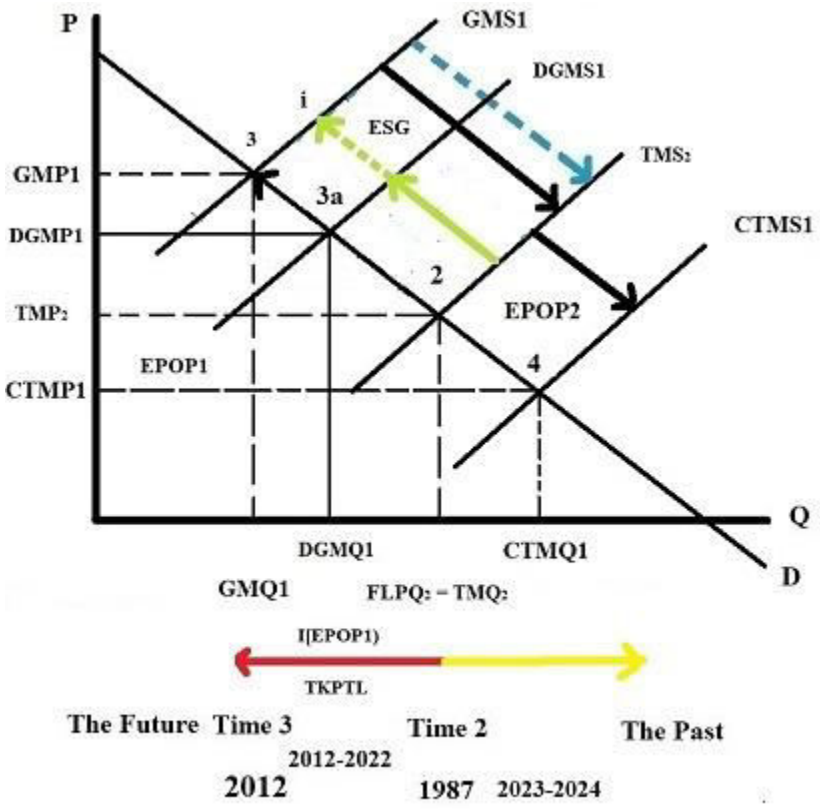

Figure 1 The 2023-2024 shift from linear traditional market thinking to circular traditional market thinking

Figure 1 above shows that in 2023-2024 the traditional linear market still had the environmental pollution production problem (EPO) we have been trying to fix since 1987 and 2012, yet a move to circular economic thinking from point 2 to point 4 is taken abandoning the need to fix the environmental pollution production problem created by the linear market that goes from point 2 to point 3 as indicated by the black arrow, and focusing attention instead on fixing resource use inefficiencies in the linear market expanding the environmental pollution problem in the process by the distance from point 2 to point 4 as indicated by the black arrow. In other words, Figure 1 above tells us that the problem is the environmental pollution production problem (EPOP) linked to the working of the traditional market (TM) that goes from point 2 to point 3 as represented by the black arrow, and the solution to the environmental pollution production problem (EPOP), full[the green market (GM) solution] at point 3 or partial(the dwarf green market (DGM) solution at point 3a], but instead circular economic thinking do the opposite, they go to the right. That means that circular economic thinking is not concerned about solving the environmental crisis as it makes its focus to solve the resource use problems of the linear market, assuming again as linear thinking did and does, environmental externality production neutrality.

Hence, Figure 1 above highlights why the circular traditional market solution is not aimed at solving the environmental sustainability problem associated with the linear traditional market, even though the word “circular” sounds nice, but it is instead geared to address the problems of resource use efficiency that the linear market has because it is an environmentally

distorted market, a distortion the World Commission on Environment and Development in 1987 and the United Nations Commission on Sustainable Development in 2012 has been trying to fix, one through environmentally friendly sustainable development means, and the other by using dwarf green markets instead of green markets. And the above means that going circular economy thinking does not just violate the theory-practice consistency principle and the expectations of the paradigm evolution loop a la Thomas Kuhn as it is not geared to solve the environmental sustainability problem, it simple leaves science based thinking behind as going from linear to circular, while it addressing resource use inefficiencies without corrected environmentally distorted traditional market prices, simple expands the environmental pollution problem of the linear market as circular markets are still environmentally distorted. It has been pointed out recently that going from linear to circular is simply a deep traditional market thinking double down (Muñoz 2024).

c) The environmental pollution problem at hand for circular economic thinkers to tackle in 2023

The main development issue in 2023 when the drive of circular thinking came was the environmental pollution production problem (EPOP) we have been attempting to solve since 1987 (WCED 1987), which drive critical global issues being addressed then such as air pollution (EEA 2023b) and global warming (WB 2023), a situation summarized in Figure 2 below:

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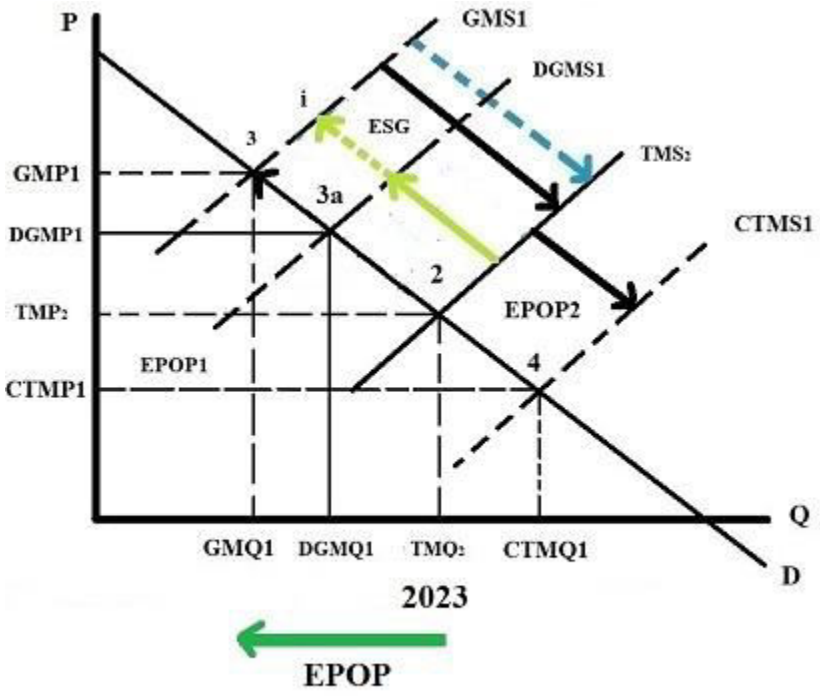

Figure 2 The environmental pollution problem that circular economic thinkers were facing in 2023

Figure 2 above shows that the traditional market (TM) at point 2 at work in 2023 has an environmental pollution production problem (EPOP) associated with it that goes from point 2 to

point 3, problem that expands as the traditional market (TM) expands as it tends to produce at the lowest traditional market price (TMP) possible. This is because at point 2 traditional market prices are environmentally distorted as they do not reflect the environmental cost of production associated with business activity; and this environmental distortion provides incentives for inefficient use of resources as environmental cost externalization is profitable. In other words, environmental price distortions are linked to the inefficient use of resources; and hence, solving the environmental sustainability problem created by environmentally distorted traditional markets also solves the inefficient use of resources problems as no environmental price distortions make the efficient use of resources profitable while polluting less.

d) The options those promoting circular thinking had in 2023 with respect to the environmental pollution production problem at hand

Given the environmental pollution problem (EPOP) at hand those promoting circular thinking had the option to use circular thinking to fix it or to use circular thinking to ignore it, a situation stated in Figure 3 below:

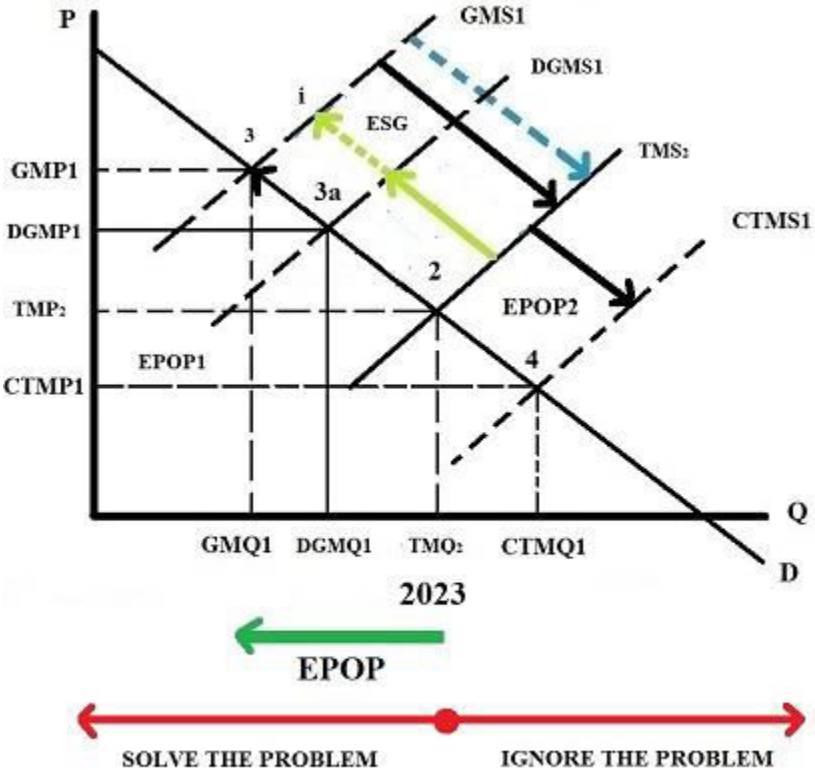

Figure 3 The choices that circular economy thinkers had to make in 2023, solve the environmental sustainability problem(EPO) or ignore it

Figure 3 above indicates the two options, to solve the environmental pollution production problem (EPOP) by using green circular thinking, or to ignore the problem using traditional circular thinking. And this decision in 2023 to ignore the environmental pollution production problem (EPOP) to go from linear traditional market thinking to circular traditional market thinking is the third development thinking blunder since 1987 for the following reasons i) the

move carries with it the environmental pollution production problem; ii) at point 2 and point 4 market prices are environmentally distorted; iii) at point 2 and point 4 we have an environmental sustainability problem being addressed with non-sustainability thinking, which violates the theory-practice consistency principle (Muñoz 2009); iii) at point 2 and point 4, the expectation of the Thomas Kuhn's paradigm evolution loop (TKPTL) are violated as environmental abnormalities embedded in the two models are not yet removed; and hence, iv) traditional circular economic thinking is being used to solve the inefficient use of the traditional linear market only, not to address the root-cause of the environmental pollution production problem, the environmental price distortions.

e) The need to understand the nature and implications of the options those promoting economic circularity thinking had when they made the decision to go the way of traditional circular markets since 2023-2024

The discussion above highlights the need to understand all those possible options to deal with the environmental pollution production problem listed above in order to stress how circular thinking could have been used to fix the problem, fully or partially or to ignore it all together the a critical problem as well as to highlight why the move from linear traditional market thinking to circular traditional market thinking is simply a deep traditional market paradigm deep double down; and then use this knowledge to point out why choosing going circular economic thinking in 2023 is the third development thinking blunder since 1987 in terms of theory-practice inconsistency (Muñoz 2009) as they do not reflect the nature of the environmental sustainability problem and in terms of paradigm evolution loop thinking inconsistency a la Thomas Kuhn (Muñoz 2022) as they still keep the abnormalities creating the environmental sustainability problem in the linear market in the first place.

Goals of this paper

1) To highlight that the issue at hand in 2023 with respect to the link linear market thinking and environmental sustainability issues was an environmental pollution production problem; 2) To stress that the development choices then were to fix the environmental pollution production problem or ignore it; 3) To point out the ways the environmental pollution production problem can be fixed fully or partially through green market circularity if the decision is to solve it; 4) To indicate the nature and implications of ignoring to solve environmental pollution production problem in order to solve the resource use inefficiencies of the linear market with traditional market circularity thinking; and 5) To link traditional circular market thinking to violation of the theory-practice consistency principle, to violation of the Thomas Kuhn's paradigm evolution loop expectation, and to the fact that it abandons the need to fix the environmental pollution production problem in order to advance the solution of resource inefficiency through traditional circular thinking, which are among the inconsistencies that makes this move linear thinking to circular thinking in 2023 the third development thinking blunder since 1987.

Methodology

First, the terminology used and operational concepts and analytical tools are provided. Second, the option to recognize the environmental pollution production problem formally in 2023 and fix it is highlighted. Third, the full fix and the partial fix using green circularity thinking available in 2023 are described in detail. Fourth, how the full fix and partial fix to the environmental pollution production problem work once they are in place is pointed out. Fifth, the option to recognize the environmental pollution production problem formally and still ignore it in 2023 is stressed. Sixth, the nature of the move from traditional linear economic thinking to traditional circular economic thinking is stated in detail emphasizing that this is a move away from the need to fix the environmental pollution production problem at hand. Seventh, how the linear traditional market and the circular traditional market work once they are in place is shown. Eight, the reasons why the move from linear traditional economic thinking to traditional circular economic thinking is the third development thinking blunder since 1987 are listed. And nineth, some food for thoughts and relevant conclusions are shared.

Terminology

P = Price Q = Quantity

D = Demand A = Social system active

a = Social system passive B = Economic system active

B = Economic system passive C = Environmental system active

c = Environmental system passive GOP = Golden paradigm

S = Sustainability market TM = Traditional market

TMP = Traditional market price TMQ = Traditional market quantity

TMS = Traditional market supply SEPOP = Socio-environmental pollution problem

POP = Pollution problem EPOP = Environmental pollution problem

GM = Green market GMS = Green market supply

GMP = Green market price GMQ = Green market quantity

DGM = Dwarf green market DGMS = Dwarf green market supply

DGMP = Dwarf green market price DGMQ = Dwarf green market quantity

EM = Environmental margin DEM = Dwarf environmental margin

CTM = Circular traditional market CTMP = Circular traditional market price

CTMS = Circular traditional market supply ESG = Environmental sustainability gap

E(C) = Environmental cost externalization I(c) = Environmental cost internalization

EPOP = Environmental pollution production problem

TKPTL = Thomas Kuhn's paradigm evolution transformation loop

Operational concepts and analytical tools

a) Concepts

1) Golden market paradigm, a paradigm without abnormalities.

2) Flawed market paradigm, a paradigm with abnormalities.

3) Traditional market paradigm, a paradigm with socio-environmental abnormalities.

4) Sustainability market paradigm, a paradigm without socio-environmental abnormalities.

5) Sustainable development, a paradigm with remaining socio-environmental sustainability gaps.

6) Red market paradigm, a paradigm without social abnormalities.

7) Green market, a paradigm without environmental abnormalities.

8) Dwarf green market, a paradigm with remaining environmental abnormalities.

9) Linear traditional market, a distorted market with resource use inefficiency problems

10) Circular traditional market, a distorted market aimed at solving the resource use inefficiency problems of the linear traditional market.

b) Analytical tools

i) Merging rules

If we have the following model paradigm P1 = km, P2 = Km, P3 = kM, and P4 = KM, then the merging rules are:

P1.P2 = (km)(Km) = (kK)m, where kK = sustainability gap K = SG_K

P1.P3 = (km)(kM) = k(mM), where mM = sustainability gap M = SG_M

P1.P4 = (km)(KM) = (kK)(mM) = (SG_K)(SG_M) = sustainability gap driven competition

P1.P1 = (km)(km) = km

P4.P4 = (KM)(KM) = KM

ii) The theory-practice consistency principle

If we have a golden paradigm in theory TGOP = KM, golden paradigm problem in practice PGOP = KM, and you have a flawed paradigm in practice PFLP = Km

1) Respecting the theory-practice consistency principle

The theory must match the practice so that

(TGOP)(PGOP) = (KM)(KM) = KM

Golden paradigm theory (TGOP) is appropriate to address golden paradigm practice (PGOP) as golden paradigm theory matches the nature of the golden paradigm practice.

2) Violating the theory-practice consistency principle

The theory does not match the practice or visa verse so that

(TGOP)(PFLP) = (KM)(Km) = K(Mm) = K(SG_M)

Golden paradigm theory (TGOP) is not appropriate to address flawed paradigm practice (PFLP) as golden paradigm theory does not work in the flawed paradigm world.

iii) The Thomas Kuhn's paradigm transformation loop (TKPTL)

If we have a flawed paradigm like FLP = Km, where "m" is the abnormality embedded in that system, we have a golden paradigm GOP = KM, with no abnormalities, and we have a sustainable development paradigm SDP = K(RSG_M), with a remaining sustainability gap M (RSG_M) as the sustainability gap is partially closed, then the transformation loop theory leads to the following:

1) The flawed paradigm to golden paradigm possibility theorem

If abnormalities are fully removed the Thomas Kuhn's paradigm transformation has then the following structure

$TKPTL_m$

FLP = Km----------→ GOP = KM

When the abnormality M is fully internalized, the flawed paradigm (FLP) shifts to take the form of the golden paradigm (GOP).

2) The flawed paradigm to flawed paradigm possibility theorem

If abnormalities are not removed the Thomas Kuhn's paradigm transformation has then the following structure

TKPTL

FLP = Km----------→ FLP = Km

When the abnormality M is not removed, the flawed paradigm (FLP) remains a flawed paradigm as no paradigm shift can take place without removing the abnormalities.

3) The flawed paradigm to sustainable development paradigm possibility theorem

If abnormalities are partially removed the Thomas Kuhn's paradigm transformation has then the following structure

$$\mathbf{FLP = Km \xrightarrow{TKPTL_{PRm}} SDP = K(RSG_M)}$$

When the abnormality M is partially removed (PRm), the flawed paradigm (FLP) shifts imperfectly towards a sustainable development paradigm (SDP) under remaining sustainability gap (RSG) pressures.

4) The sustainable development paradigm to golden paradigm impossibility theorem

If abnormalities are partially removed the Thomas Kuhn's paradigm transformation has then the following structure

$$\mathbf{SDP = K(RSG_M) \xrightarrow{TKPTL_{PRm}} SDP = K(RSG_M)}$$

When the abnormality M is only partially removed there is a remaining sustainability gap (RSG_M), and hence, the sustainable development paradigm (SDP) remains a sustainable development paradigm (SDP) as the abnormality "m" is not fully removed, just partially removed (PRm), no way to become a golden paradigm (GOP) as there is no incentive to do so.

5) Perfect paradigm shifts under the influence of the Thomas Kuhn's paradigm evolution loop

If we have a golden paradigm Q = TKL and a flawed paradigm FLP = Tkl, then the following holds true:

a) One step paradigm shift

If we remove the two abnormalities in the flawed paradigm (FLP) at the same time, then the structure of the shift is the following:

$$\mathbf{FLP = Tkl \xrightarrow{TKPTL_{kl}} Q = TKL}$$

Fully removing both abnormalities at once leads to the flawed paradigm (FLP) shifting to a golden paradigm Q

b) Two steps paradigm shift type 1

If we give priority to removing fully abnormality "k" first and then remove fully abnormality "l", then the structure of the shift is:

$TKPTL_k$ $TKPTL_l$

FLP = Tkl----------→TP1 = TKl----------→ Q = TKL

Hence, removing fully abnormality "k" first shift the flawed paradigm to a transition paradigm TP1 = TKl, and then removing fully abnormality 'l" leads to the golden paradigm Q.

c) Two steps paradigm shift type 2

If we give priority to removing fully abnormality "l" first and then remove fully abnormality "k", then the structure of the shift is:

$TKPTL_l$ $TKPTL_k$

FLP = Tkl----------→TP2 = TkL----------→ Q = TKL

Hence, removing abnormality "l" fully first shift the flawed paradigm to a transition paradigm TP2 = TkL, and then removing fully abnormality 'k" leads to the golden paradigm Q.

6) Perfect and imperfect green market shifts

`If we assume that the traditional market (TM) is a dominant economy (B) only model that generates only environmental externalities(E[C]), then its structure is TM = Bc since E(C) = c = environmental externality, and the following holds true:

i) The shift from perfect traditional markets to perfect green markets

If we remove fully the environmental externality E(C) = c, then the traditional market shift perfectly to perfect green markets, which can be stated as indicated below:

TKPTLc

TM = Bc = B(ESG)----------→ GM = BC

If we subject the traditional market to the Thomas Kuhn's paradigm transformation loop and the environmental abnormality is internalized (TKPTLc), and therefore, removed, then we have a perfect paradigm shift/a free green market. Notice that the internalization of the environmental externality({I[E(C) = I(c) = C})

ii) The shift from perfect traditional markets to dwarf green markets

If we remove partially the environmental externality ($PR_{E(C)=c}$), then the traditional market shift imperfectly to imperfect dwarf green markets, which can be stated as shown below:

$TKPTL_{(PRc = ESG)}$

TM = Bc = B(ESG)----------→DGM = B(RESG)

If we subject the traditional market to the Thomas Kuhn's paradigm transformation loop and the environmental abnormality is only partially removed ($TKPTL_{PRc}$), and therefore, there is a remaining environmental sustainability gap (RESG), then we have an imperfect paradigm shift/

a non-free dwarf green market. Notice that the partial internalization of the environmental externality($\{PR_{E(C)} = PR_{(c)} = PR_{(ESG)}\}$) leads to the remaining sustainability gap ($RESG_C$).

7) The move from perfect traditional markets to perfect circular traditional markets

If we do not remove the environmental externality [E(C) = c = ESG], then the traditional market moves perfectly to the perfect circular traditional markets, which can be stated as indicated below:

TKPTL = 0

TM = Bc = B(ESG)----------→CTM = B(ESG)

If ignore the Thomas Kuhn's paradigm transformation loop (TKPTL = 0), perfect traditional market thinking (TM) takes the form of perfect circular traditional market thinking (CTM); and therefore, a move is made that assumes that the environmental sustainability gap (ESG) created and affecting those markets does not matter. As circular traditional market (CTM) expands the environmental sustainability gap (ESG) expands too but the problem can be ignored if you assumed in this model too that it works under environmental externality neutrality. Simply going from traditional linear to traditional circular thinking ignores the paradigm evolution loop expectation (TKPTL) as the abnormality, the environmental sustainability gap (ESG) is not removed during the move.

The option to recognize the environmental pollution production problem formally and fix it

1) Green circularity and environmental sustainability problem solving

If circular economy thinker wanted to address the environmental pollution problem (EPOP) in 2023, then they could have used green circular thinking to address the environmental pollution problem partially by bringing green circularity into dwarf green markets (DGM); and if they wanted to fully fix it, they could have advocated green market circularity through green markets (GM), a situation shown in Figure 4 below:

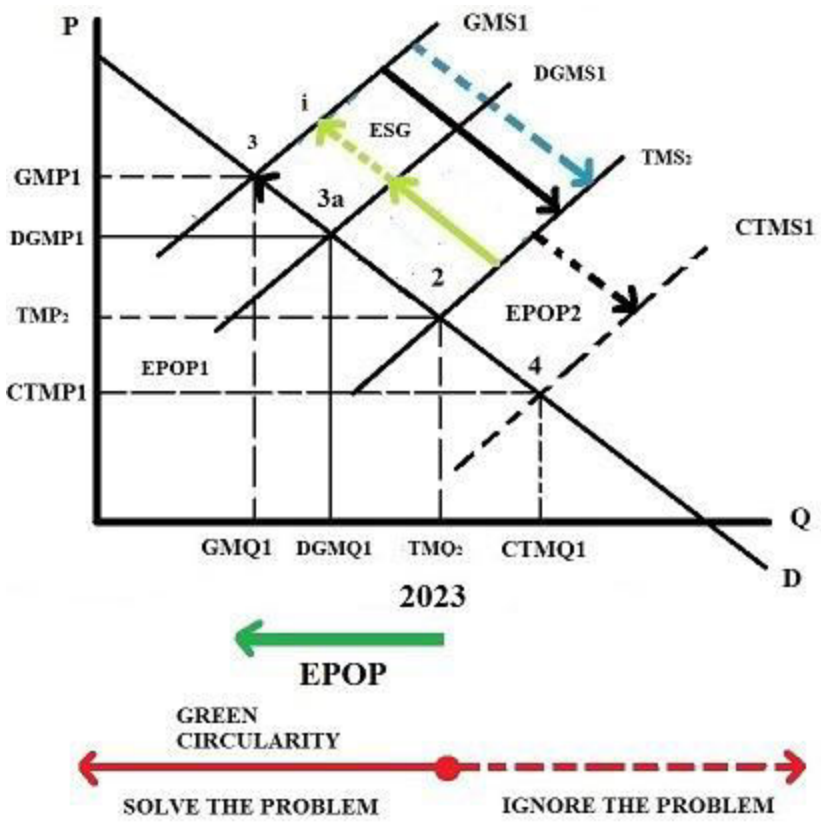

Figure 4 Solving the environmental pollution problem by going the way of green market circularity

Figure 4 above shows that in the face of the environmental pollution problem(EPOP) at hand in 2023 promoters of circular thinking could have used green circularity to solve the environmental pollution production problem (EPOP) partially through circular dwarf green markets (DGM) such as the one at point 3a or fix it fully through circular green markets (GM) such as the one at point 3.

2) The working of circular dwarf green markets and green markets once in place

Once in place, we should expect circular dwarf green markets (DGM) to contract from right to left to reduce environmental pollution production as the dwarf green market margin (DEM) is increase; and we should expect circular green markets (GM) to expand from left to right as the green market price (GMP) decreases as environmental cost (EM) associated with business activity decreases, a situation shared in Figure 5 below;

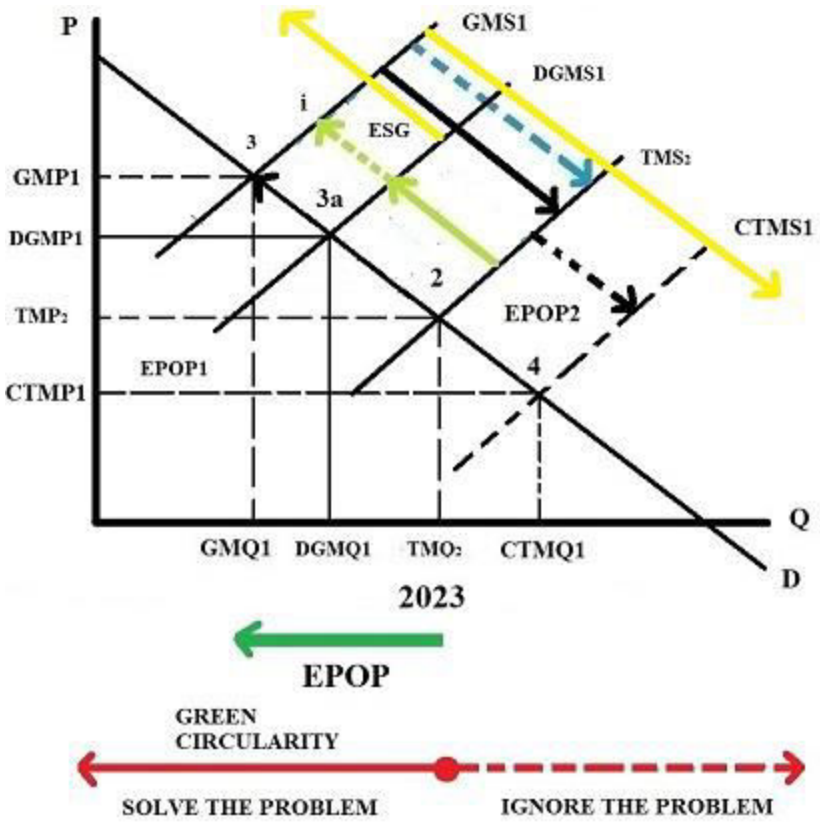

Figure 5 The working of circular dwarf green markets and circular green markets

Figure 5 above shows the following i) that as the dwarf green market price (DGMP) increases as the environmental cost to pass to consumers (DEM) increases they will contract to the left of point 3a, contracting even more if dwarf environmental costs (DEM) increase more as indicated by the yellow arrow moving from right to left leading to less production and consumption and less pollution at the same time; and ii) that as the green market price (GMP) decreases because of decreasing environmental costs (EM) associated with business activity, then they will expand from left to right and expand more as environmental cost (EM) are reduced more as shown by the yellow arrow moving from left to right, creating more profits and less pollution at the same time,

The option to recognize the environmental pollution production problem formally and still ignore it

1) Traditional circularity and environmental sustainability problem solving

If circular economy thinker wanted avoid addressing the environmental pollution problem (EPOP) at hand in 2023, then they can use traditional circular economic thinking to point to an improvement of the resource use inefficiency problem under which environmentally distorted traditional linear markets work as a justification for the shift, but they know or should

have known that circular market pricing has the same distortions as linear market pricing, and therefore, a move from traditional linear thinking to circular traditional thinking is not aimed at solving the environmental pollution production problem (EPOP) at hand as the environmental distortions are still not removed, a situation summarized in Figure 6 below:

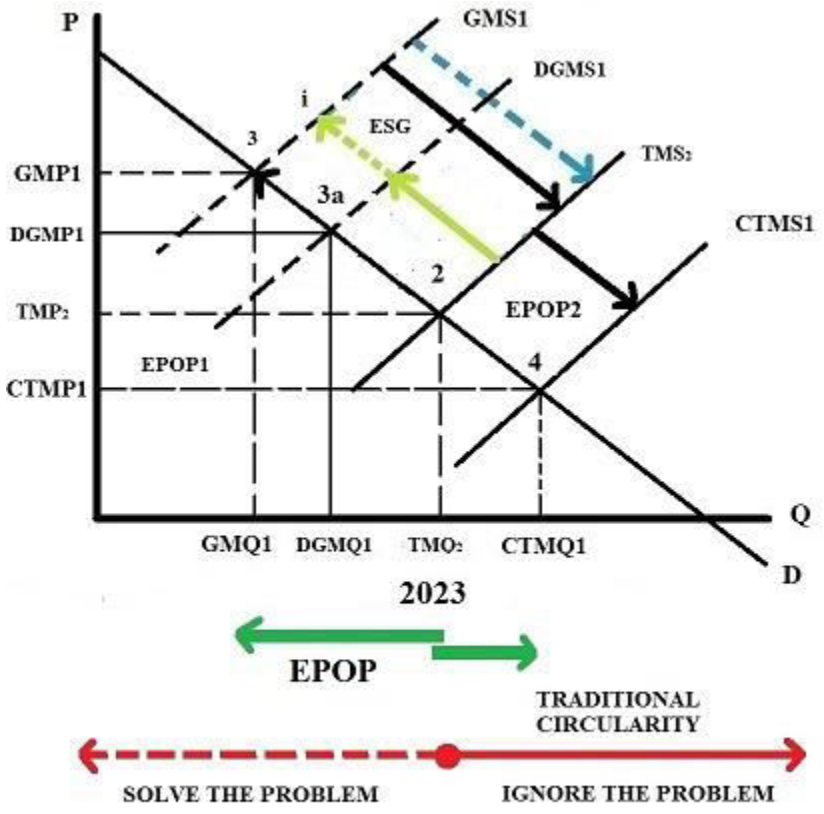

Figure 6 **Ignoring the environmental pollution production problem(EPO) by going the way of traditional market circularity**

Figure 6 above indicates that in the face of the environmental pollution problem (EPOP) at hand in 2023 promoters of circular thinking went the other way a used traditional economy circularity thinking to address the resource efficiency problems of the linear market at point 2 and move it to point 4 while ignoring the fact that the environmental distortions are still there, but assumed away, and hence, this is a move that abandons the need to fix the environment pollution production problem (EPOP) now embedded in the circular traditional market at point 4, and the reason why going circular expands the environmental pollution production problem from point 2 to point 4 of the size of EPOP2 as indicated by the black arrow from point 2 to point 4.

2) How traditional linear market thinking and traditional circular market thinking work once those markets are in place

Both linear and circular market thinking should be expected to tend to produce at the lowest market price possible, lowest linear price and lowest circular price as environmental cost externalization [E(C) = c] is still taking place and therefore, more environmental pollution

(EPOP) is created as they expand as shown by the yellow arrows in Figure 7 below moving from left to right:

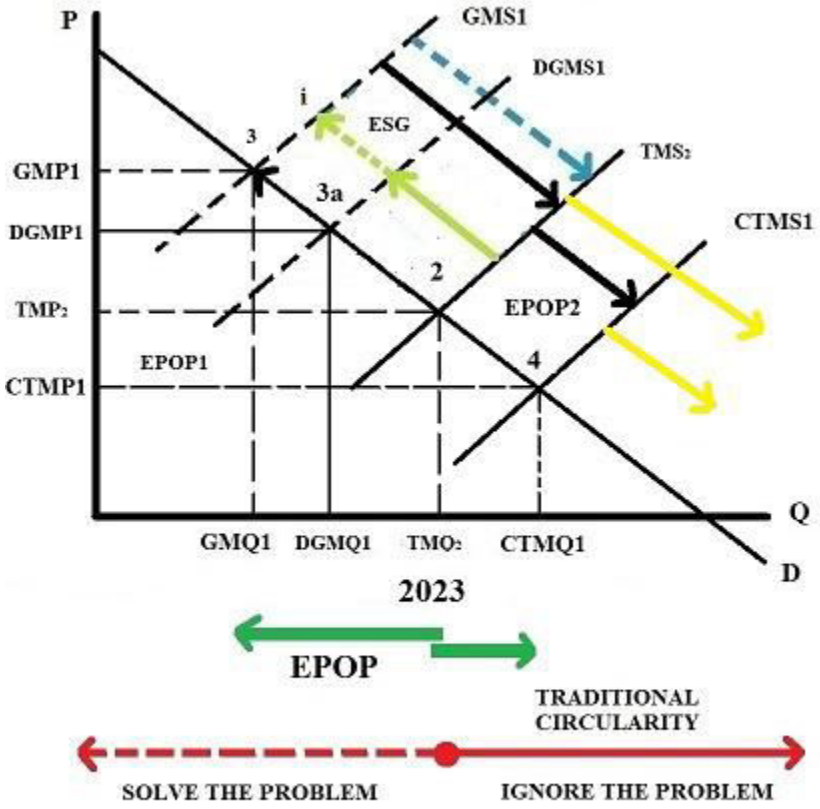

Figure 7 The working of circular traditional markets once in place

Figure 7 above describes the tendency that both traditional linear markets (TM) and the new traditional circular markets (CTM) have to produce at the lowest market price possible as externalizing environmental costs as much as possible is assumed to be free exercise as indicated by the yellow arrows moving from left to right. These markets simply assume that they can expand forever without producing environmental externalities when addressing resource use inefficiency issues. The circular market point at point 4 is a point where there is a more efficient use of resources than at point 2, both points operate under environmentally distorted market prices, and hence, circular traditional markets are trying to improve resource use efficiency under environmentally distorted pricing ignoring the link environmentally distorted market prices and inefficient use of resources that exists at point 2.

The inconsistencies embedded in the decision of going the circular traditional market way

The inconsistencies that can be highlighted with the move from linear thinking to circular thinking in 2023 are pointed out in Figure 8 below:

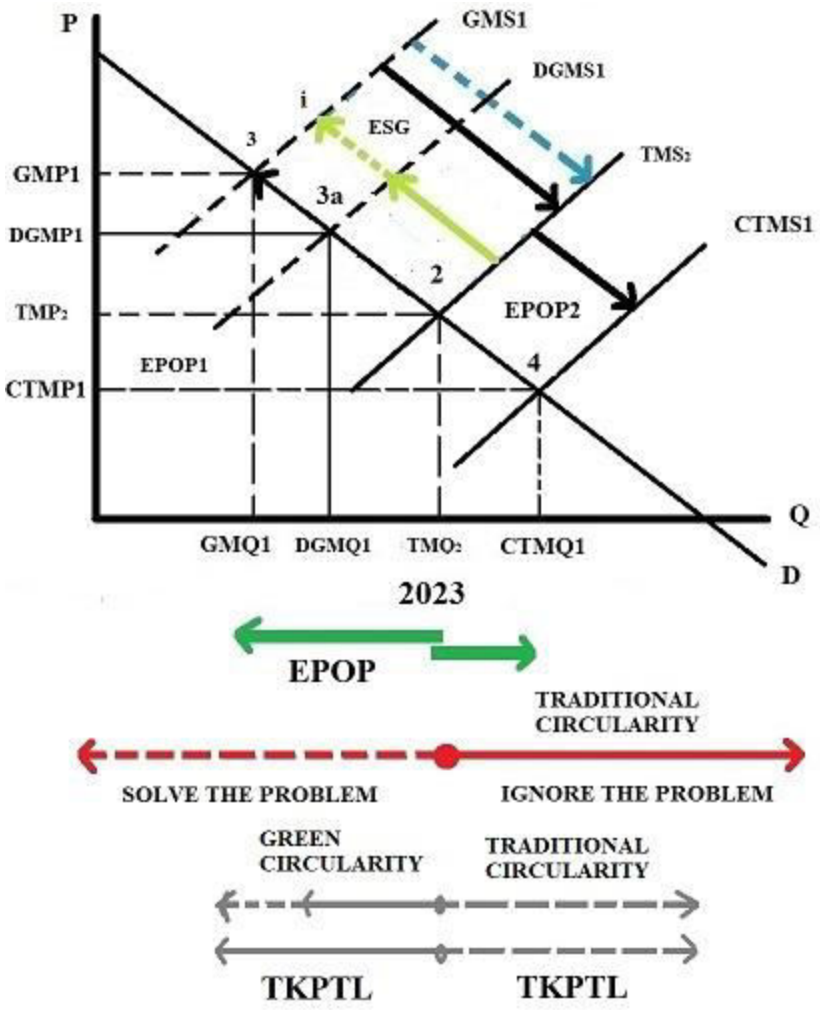

Figure 8 The abandonment of the theory-practice consistency principle and of the expectations of the Thomas Kuhn's scientific paradigm evolution loop

Figure 8 above indicates four main inconsistencies with the move to circular economic thinking in 2023, the move from linear thinking at point 2 to circular thinking at point 4 and they are the followings: i) it leaves the pollution production problem (EPOP) solving behind as it focuses only on resource use inefficiency issues; ii) it violates the theory-practice consistency principle; iii) it violates the Thomas Kuhn's paradigm evolution expectations for science based paradigm shift, and iv) if it is a move from a pollution production point to another pollution production point. All these inconsistencies are pointed out below in detail.

a) Abandoning the need to solve the environmental pollution production problem head on

We can see in Figure 8 above that a move from point 2 /traditional market thinking (TM) to point 4 / circular traditional market thinking (CTM) means choosing to leave the environmental pollution production problem at hand behind to improve the working of linear thinking in terms of resource use instead as indicated by the red arrow from point 2 to point 4. Keep in mind that circular traditional markets CTM) still work under environmentally distorted pricing that feed their associated environmental sustainability gap (ESG) as the environmental

pollution problem (EPOP) expands from point 2 to point for by the size of EPOP2 as shown in Figure 8 above, which means that circular market thinking (CTM) should be expected to complicate even more the need to address the environmental pollution production problem (EPOP) and the need to move towards environmentally clean economies (ECLM) once and for all in the future.

b) Abandoning the theory-practice consistency principle

Notice that at point 3 we have an environmental sustainability problem and we are using a sustainability-based solution, circular green market thinking, so it respects the theory-practice consistency principle, sustainability theory for sustainability practice, as indicated by the continues gray arrow going from point 2 to point 3. At point 3a we have an environmental sustainability problem and we are using a non-sustainability-based solution/partially environmentally distorted approach, dwarf circular green market thinking, so it violates the theory-practice consistency principle, non-sustainability theory for sustainability practice, as indicated by the broken gray arrow from point 2 to point 3a. At point 2 we have an environmental sustainability problem and we have a non-sustainability-based approach/a fully environmentally distorted approach so it violates the theory-practice consistency principle, non-sustainability theory for sustainability practice. And at point 4, we have still an environmental sustainability problem and we have a non-sustainability-based approach delinked from the need to solve the environmental pollution problem (EPOP) at had so abandoning the need to maintain the theory-practice consistency principle in the process by using theory inconsistent with the sustainability practice as indicated by the broken gray arrows from point 2 to point 4.

c) Abandoning the Thomas Kuhn's paradigm evolution loop expectation (TKPTL)

We can appreciate in Figure 8 above two important things: i) the compliance with the Thomas Kuhn's paradigm evolution transformation loop (TKPTL) moves right to left from point 2 as there is partial environmental cost internalization at point 3a/DGM, and full environmental cost internalization at point 3/GM, and ii) the non-compliance with the Thomas Kuh's paradigm evolution transformation loop (TKPTL) moves from left to right from point 2 and hence, at point 4/CTM there is a full violation of this expectation as no environmental abnormalities have been removed as circular market prices remain fully environmentally distorted market prices.

d) A move from linear pollution production markets to circular pollution production markets

We can also observe based on the information on Figure 8 above that when the traditional market (TM) expands to the right of point 2 then more is produced and consumed and more pollution takes place; and we can see too that when the circular traditional market (CTM) expands to the right of point 4 again then more is produced and consumed and more pollution takes place. So, the move from linear traditional thinking to circular traditional thinking is a move from an environmental pollution production market to another environmental pollution production market, which is one of the aspects that make this move the third development thinking blunder since 1987.

Why choosing the way of traditional circular economic thinking in 2023 is the third development thinking blunder since 1987?

The discussion above is summarized in Table 1 below in terms of models that respect both the theory-practice consistency principle and that respect Thomas Kuhn's paradigm evolution loop expectations where the full removal of environmental abnormalities embedded in the distorted traditional market leads to shift to golden paradigms like perfect green market paradigms.

TABLE 1 Possible solutions to the environmental sustainability problem in 2023

Solutions	Respect the Theory-practice Consistency Principle	Consistent with Thomas Kuhn's Paradigm evolution Loop expectation	Addresses both Price distortions And inefficient Use of resources Problem	Aimed At Solving The EPOP Problem
Partial Green Circularity Solution	**NO**	**NO**	**YES (partially)**	**YES (partially)**
Full Green Circularity Solution	**YES**	**YES**	**YES (fully)**	**YES (fully)**
Circular Traditional Market	**NO**	**NO**	**NO**	**NO**

Solution

We can see based on the information in Table 1 above the following about the traditional circular economy thinking at work at point 4 of Figure 8 above: i) that traditional circular economic thinking at point 4 is not consistent with the theory-practice consistency principle as non-systematic theory is used at a point where there is an environmental sustainability problem; ii) that traditional circular thinking at point 4 is inconsistent with the Thomas Kuhn's paradigm evolution loop expectation as circular traditional market prices are still environmentally distorted market prices so the environmentally abnormality is not yet removed, iii) that traditional circular economic thinking at point 4 does not address both the environmental price distortion and the inefficient use of resources at the same time, it only focuses on the inefficient use of resources, iv) that traditional circular economy thinking at point 4 is not aimed at solving the environmental pollution production problem at hand, as it is technically geared to be a resource use improvement tool, and v) point 4 is an environmental pollution production point just point 2 is an environmental pollution production point so the move from linear market thinking at point 2 to circular market thinking at point 4 is a move from pollution production markets to pollution production markets. All these aspects above make the move from traditional linear economic thinking to traditional circular economic thinking the third development thinking blunder since 1987 as this thinking is not even geared at solving the environmental pollution production problem researchers and decision-maker knew or should have known in 2023, but a thinking directed at addressing resource use inefficiencies under environmental externality neutrality assumptions when the externalities are real and have been driving the need to fix the problem since 1987(WCED 1987), which violate science based decision-making.

Food for thoughts

1) Are traditional circular markets environmentally clean market transition friendly? I think No, what do you think? 2) Are traditional circular markets environmentally distorted markets too? I think Yes, what do you think? and 3) Is the move from linear market thinking to circular market thinking a move that perpetuates the process of green market paradigm shift avoidance taking place since 2012 Rio + 20? I think Yes, what do you think?

Conclusions

First, it was pointed out that the problem at hand to be addressed in 2023 was an environmental pollution production problem driven by environmentally distorted traditional market prices, which encourages the inefficient use of resources as environmental cost externalization costs nothing. Second, it was highlighted that decision-makers and academics had two choices in 2023, to fix the problem or to ignore the problem. Third, it was stressed that

if they chose to fix the problem, fully or partially, they could have used green circularity thinking. Fourth, it was indicated that if they chose to ignore the environmental pollution problem and focus only on resource use efficiency issues, they can use traditional circular economic thinking. Fifth, it was stated that they chose to ignore the environmental pollution production problem, and focus on solving the resource efficiency issues associated with the linear market. And Sixth, it was shown that the move from linear thinking to circular thinking in 2023 is a move that violates the theory-practice consistency principle, that violates the Thomas Kuhn's paradigm evolution loop expectation, that leaves the need to solve the environmental pollution problem behind, and that simply takes you from a pollution production market point to another pollution production market point, which makes this move from linear to circular thinking in 2023 the third development thinking blunder since 1987.

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