Citation:

Muñoz, Lucio, 2025. **Environmental sustainability thought 102: The theory of how to link the critical pollution production generation problem with the critical pollution production solving problem step by step to point out expected problem solutions and failures? What are the implications of doing this?**. In ***CEBEM-REDESMA Boletin***, Año 19, Nº 10, October, La Paz, Bolivia.

Environmental sustainability thought 102: The theory of how to link the critical pollution production generation problem with the critical pollution production solving problem step by step to point out expected problem solutions and failures? What are the implications of doing this?

By

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Abstract

We have been trying to solve critical development problems formally since 1987's World Commission on the Environment and Development, following different means like sustainable development thinking (from 1987 to now), dwarf green market thinking (from 2012 to now), and traditional circular economic thinking (from about 2022 to now), yet the pollution problem and the issues at hand like global warming keep getting worse and worse, which raises a key academic question, why and the implications of that why?. The goal of this paper is to show how to link the critical pollution production generation problem with the critical pollution production solving problem step by step in simple terms to point out the why of failures and solutions and the implications of that why in terms of impossibility and possibility based critical pollution production solving problem impossibility zone theory and critical pollution production problem solving point theory, respectively. And this framework can be used to see clearly which past and current tools should be expected to solve the critical development problem at hand and which not and why.

Introduction

We have been trying to solve critical development problems formally since 1987's World Commission on the Environment and Development, following different means like sustainable development thinking (from 1987 to now) (WCED 1987), dwarf green market thinking (from 2012 to now) (UNCSD 2012a; UNCSD 2012b), and traditional circular economic thinking (more

active from about 2022 to now) (WB 2022; OECD 2024; OECD 2025a), yet the pollution problem and the issues at hand like global warming keep getting worse and worse (IPCC 2021a; IPCC 2021b; OECD 2025b), which raises a key academic question, why and the implications of that why? The goal of this paper is to show how to link the critical pollution production generation problem with the critical pollution production solving problem step by step in simple terms to point out the why of failures and solutions and the implications of that why in terms of impossibility and possibility based critical pollution problem solving impossibility zone theory and critical pollution production problem solving possibility point theory, respectively. And this framework can be used to see clearly which tools, past and current, should expected to solve the critical development problem at hand and which not and why.

Goals of this paper

a) To state link market dynamics and critical development problem dynamics and break it into positive loops and negative loops); b) To highlight the pollution production problem separating negative market dynamics from negative critical development problem dynamics; c) To point out the critical pollution production problem links that allow negative dynamics to persist and accumulate; d) To stress place and nature of the critical problem solving impossibility zone and its empty solutions implications; e) To indicate the place and nature of the critical problem solving possibility point and its unique solution implications; and f) To generalize the idea of the critical problem solving possibility point to covered different possible solutions depending on the transition goal and the unique solution implications of this general possibility point.

Methodology

First, the terminology used in this paper is shared. Second, some key operational concepts are given. Third, the link market dynamics and critical development problems is pointed out. Fourth, the positive loop linking market dynamics and critical development problems is stressed. Fifth, the negative loop linking market dynamics and critical development problems is shown. Sixth, the critical pollution production generating problem at the heart of the negative loop linking market dynamics and critical development problems is stated. Seventh, the missing critical pollution production problem solving links that allow the critical problem generation problem to persist until system collapse are indicated. Eight, the general critical pollution production problem solving impossibility zone is highlighted. Nineth, the critical pollution production problem solving possibility point is shown. Tenth, the general critical pollution production problem solving possibility point is stressed. And finally, eleventh, some food for thoughts and relevant conclusions are listed.

Terminology

M = Market

CDP = Critical development problem

REM = Responsible market dynamics

IRM = Irresponsible market dynamics

RECDP = Responsible critical development problem dynamics

IRCDP = Irresponsible critical development problem dynamics

POPP = Pollution production problem

PRTGP = Pollution reduction technology gap problem

TTP = Transition tool problem

PES = Polluting energy source

NPES = No polluting energy source

PTT = Proper transition tool

CM = Clean market

CMi = Clean market “i”

PTTi = Proper transition tool “i”

T1 = No transition-based tool “1”

Ti = No transition-based tools “i”

POPPi = Pollution production problem “i”

PRTGPi = Pollution reduction technology gap “i”

PESi = Polluting energy source “i”

NPESi = No polluting energy source “i”

RETG = Renewable energy technology gap

RE = Renewable energy

NRE = Non-renewable energy

ECLM = Environmentally clean market

DM = Dirty market

Operational concepts

1) Clean market, a pollution-less market.

2) Dirty market, a pollution production market.

3) Problem solving impossibility zone, the place where no full solution to the pollution production problem exists.

4) Problem solving possibility point, the only place where the conditions for a full solution to the pollution production problem exist.

5) Pollution production problem, the issue that separates dirty economies from clean economies.

The link market dynamics and critical development problems

It can be said that market dynamics (M) can have a positive or a negative impact on critical development problem dynamics, which can be summarized as done in Figure 1 below:

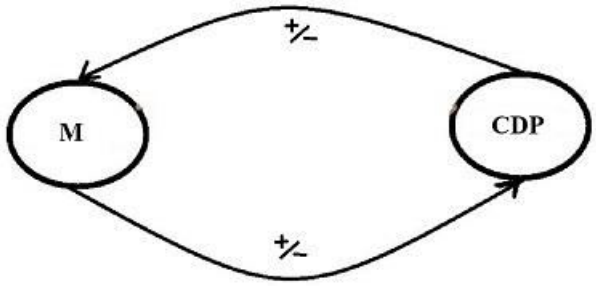

Figure 1 Linking market dynamics (M) to critical development problem dynamics (CDP)

We can see based on Figure 1 above that just as market dynamics can have a positive (+) or negative (-) impact on critical development problem dynamics; also, critical development problem dynamics (CDP) can have a positive (+) or negative (-) on market dynamics (M).

The positive loop linking market dynamics and critical development problems

When market dynamics act responsibly (REM) they have a positive impact (+) on responsible critical development problem dynamics (RECDP), which in term has a positive impact (+) on responsible market dynamics (REM), a situation indicated in Figure 2 below:

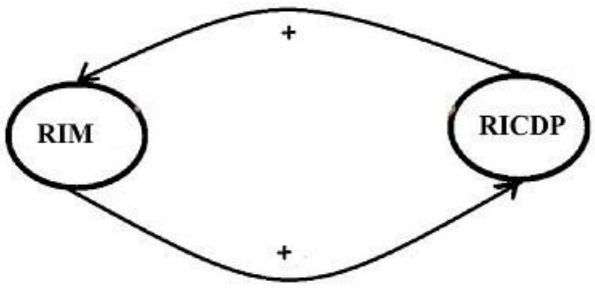

Figure 2 The positive loop linking market dynamics (M) to critical development problem dynamics (CDP)

Hence, Figure 2 above indicates a positively reinforcing loop, responsible market dynamic impacts (REM) lead to responsible critical problem payback (RECDP), a positive behavior loop.

The negative loop linking market dynamics and critical development problems

When market dynamics act irresponsibly (IRM) they have a negative impact (-) on irresponsible critical development problem dynamics (IRCDP), which in term has a negative impact (-) on irresponsible market dynamics (IRM), a situation summarized in Figure 3 below:

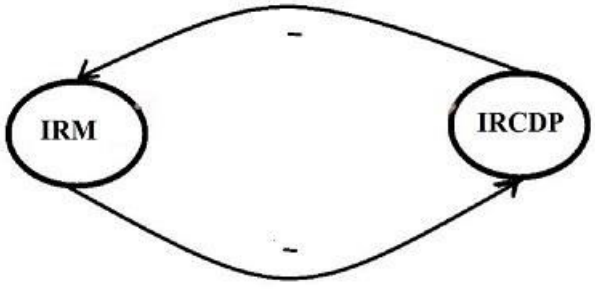

Figure 3 The negative loop linking market dynamics (M) to critical development problem dynamics (CDP)

Hence, Figure 3 above shows a negatively reinforcing loop, irresponsible market dynamic impacts (IRM) lead to irresponsible critical problem payback (IRCDP), a negative behavior loop.

The critical pollution production generating problem at the heart of the negative loop linking market dynamics and critical development problems

There is a pollution production problem (POPP) separating irresponsible market dynamics (IRM) from irresponsible critical development problem dynamics driven by the negative loop (IRCDP) as highlighted in Figure 4 below:

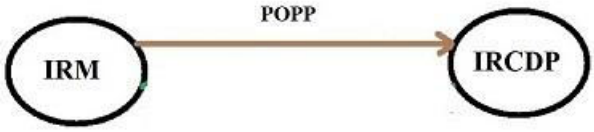

Figure 4 The negative impact that drives the negative loop is the pollution production problem (POPP)

Figure 4 above tells us that irresponsible market dynamics (IRM) displays a pollution production problem (POPP) that negatively affects irresponsible critical development problem dynamics (IRCDP).

The missing critical pollution production problem solving links that allow the critical problem generation problem to persist until system collapse

When there is a pollution production problem (POPP) there is a pollution reduction technology gap problem (PRTGP) and there is a pollution reduction transition tool problem (TTP) and there is a need to set up a clear pollution reduction transition goal to fully solve the pollution production problem (POPP) shifting this way irresponsible market dynamics (IRM) towards responsible market dynamics (REM), these missing links are indicated below in Figure 5:

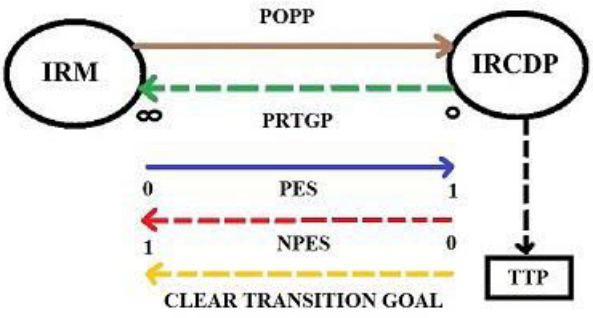

Figure 5 The missing links that allow the the negative pollution production impact to persist and accumulate

Figure 5 above indicates that when under irresponsible market dynamics (IRM) the pollution production problem solving has the following links missing, perhaps because under paradigm shift knowledge gaps and from inside the box, we cannot see them, namely: i) the

pollution reduction technology gap problem, ii) the proper pollution reduction transition tool problem, and 3) the clear pollution reduction transition goal problem needed to guide the reduction tools and the closing of the technology gap to permanent substitute a pollution based world by a pollution-less one.

The general critical pollution production problem solving impossibility zone

When no-clear transition tools (Ti) are used to address the critical pollution production problem (POPP), no solution should be expected, even in the long-term, as when using them we create a permanent critical pollution production market failure, with no transition link toward a pollution-less world, keep it us always in the irresponsible market dynamics world permanently, and the area where all these non-transition problem solving tools (Ti) can be located create the general critical pollution production problem solving impossibility zone as stated in Figure 6 below:

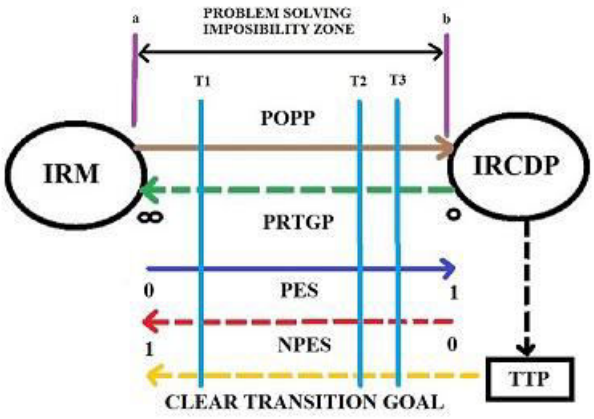

Figure 6 The critical development problem solving impossibility zone

Figure 6 above shows the critical pollution production problem impossibility zone, found between point "a" and point "b", any no-transition tool like T1, T2, T3… should not be expected to solve the pollution production problem (POPP) as all of them operate under permanent pollution production market failure and under the influences of remaining pollution production gap problems. They have no incentive for setting up a clear pollution production reduction goals to address the clear goal problem they have as indicated by the broken gold arrow going from right to left from IRCDP to IRM; they have no incentives to set up proper pollution reduction transition tools to address the transition tool problem (TTP) as indicated by the broken black arrow from IRCDP to TTP; and they have no incentives to close the pollution reduction technology gap (PRTGP) as indicated by the broken green arrow from IRCDP to IRM as they continue to operate using polluting energy sources (PES) as they work as indicated by the continuous blue arrow from IRM to IRCDP as no incentive to permanent substitute polluting

energy sources (PES) by non-polluting energy sources (NPES) as indicated the broken red arrow related to the no-polluting energy sources (NPES) going from IRCDP to IRM. Notice that the pollution production problem is a sustainability problem and the no-transition tools used as non-systematic tools so not being able to solve a sustainability problem with unsustainability tools should not be a surprised.

Implication 1:

You cannot expect to solve a sustainability problem with the use of unsustainability or no-transition tools as this violates both the theory practice consistency principle and the Thomas Kuhn's scientific paradigm evolution loop.

Implication 2:

If suddenly the supply of polluting energy sources (PES) driving the pollution production problem (POPP) disappear there would be economic black outs at any point of the critical problem solving impossibility zone T1…..Tn where non-transition tools are located as since there would be no enough non-polluting energy sources (NPES) available to permanent substitute the energy needs created by the absence of polluting sources of energy as the pollution reduction technology gap problem (PRTGP) has not been addressed yet. And there are no incentives for non-transition tools to prevent or avoid economy black outs as maximizing pollution reduction here is not a profit-making opportunity.

The critical pollution production problem solving possibility point

At the point where the process of permanently substituting polluting energy sources (PES) with no polluting energy sources (NPES) begins there is a problem-solving possibility point, as indicated by point "b" in Figure 7 below:

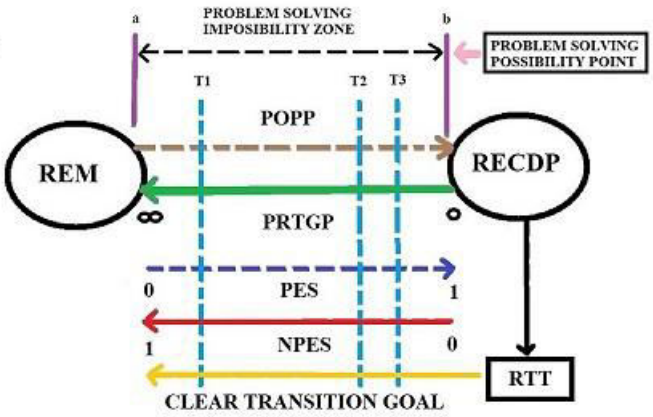

Figure 7 The structure of the critical development problem solving possibility point

Figure 7 highlights the characteristics of the pollution problem solving possibility point: i) A clear transition goal is stated towards responsible market dynamics (REM) as indicated by the continuous gold arrow from RTT to the left; ii) the right pollution reduction transition tool (RTT) is now in place as indicated by the continuous black arrow from RECDP to RTT; and iii) the pollution reduction technology gaps is closed (as indicated the continuous green arrow from RECDP to REM to help the right transition tool (RTT) to produce at the lowest transition market price possible, where polluting energy sources (PES) are permanently substituted by no polluting energy sources (NPES) as indicated by blue arrow going from left to right and by the continuous red arrow going from right to left, respectively. Notice that the pollution production problem (POPP) brown arrow in Figure 7 above going from left to right is broken as now it is possible to solve it and also notice that the vertical lines T1, T2, T3… are broken as no-transition tools do not work in a transition-based world.

Implication 3:

You can expect to solve a sustainability problem with the use of sustainability or transition tools as this respects both the theory practice consistency principle and the Thomas Kuhn's scientific paradigm evolution loop.

Implication 4

If suddenly the supply of polluting energy sources (PES) driving the pollution production problem (POPP) suddenly disappear there would be economic black outs at any point during the transition from dirty economies to clean economies if the pollution reduction technology gap problem (PRTGP) has not been fully closed when the proper transition tool is in place (PTT) since there would be not enough non-polluting energy sources (NPES) available to permanent substitute the energy needs created by the sudden absence of polluting sources of energy as the pollution reduction technology gap problem (PRTGP) has not been fully closed yet. But there are incentives for proper transition tools PTT to prevent or avoid economy black outs as maximizing pollution reduction here is a profit-making opportunity.

The general critical pollution production problem solving possibility point

We can generalize the critical pollution production problem solving possibility point framework to reflect specific clear goals reflecting specific priorities, which would require specific proper pollution reduction transition tools and specific pollution reduction technology gaps that need to be closed. For example, if priority is to transition to a clean world "K" and the goal is to transition to the clean world "K", and to do that we need the right pollution reduction transition tool for "K" such as RTTk and we need to close the pollution reduction technology gap for "K" such as PRTGk, and this situation can be generalized as summarized in Figure 8 below in terms of different types of clean markets (CMi) possibles as responsible markets (REM):

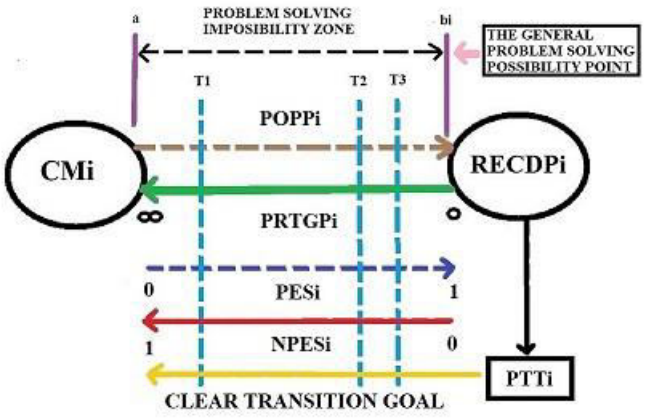

Figure 8 The general structure of the critical development problem solving possibility point

Figure 8 indicates that transition towards the specific clean market CMi requires a proper transition tool PTTi, a specific pollution reduction technology gap problem to close PRTGPi as well as requiring specific no polluting energy sources NPESi to permanently replace the polluting ones PESi, all this happening at the critical pollution production problem solving possibility point "bi". For example, if the goal is to transition to environmentally clean markets (ECLM = CMi), then we need the proper environmental pollution reduction transition tools like green markets and we need to close the renewable energy technology gap (RETG = PRTGPi) by permanently substituting the use of non-renewable energy (NRE = PESi) for renewable one (RE = NPESi).

Implication 5:

You can generalize the expectation to solve a specific sustainability problem with the use of specific sustainability or transition tools as each specific transition goal to specific clean markets respects both the theory practice consistency principle and the Thomas Kuhn's scientific paradigm evolution loop.

Implication 6

If suddenly the supply of polluting energy sources (PESi) driving the pollution production problem (POPPi) suddenly disappear there would be economic black outs at any point during the transition from dirty economies to clean economies if the pollution reduction technology gap problem (PRTGPi) has not been fully closed when the proper transition tool is in place (PTTi) since there would be not enough non-polluting energy sources (NPESi) available to permanent substitute the energy needs created by the sudden absence of polluting sources of energy as the pollution reduction technology gap problem (PRTGPi) has not been fully closed yet. But there are incentives for proper transition tools PTTi to prevent or avoid economy black outs as maximizing pollution reduction here is a profit-making opportunity.

Food for thoughts

1) Are no transition markets permanent pollution production-based market failure markets? I think Yes, what do you think?; 2) Can you solve a linear pollution production problem by making it a circular pollution production problem? I think No, what do you think?; 3) Are environmental pollution management markets no environmental transition markets? I think Yes, what do you think?; And 3) Does solving the true sustainability problem requires sustainability markets as the proper transition tool? I think Yes, what do you think?

Conclusions

First, it was shown step by step that market dynamics and critical development problem dynamics can be seen as positive or negative loops. Second, it was pointed out that the negative loop is feeding a pollution production problem that needs to be fixed. Third, it was highlighted that no-transition tools should not be expected to solve the critical pollution production problem as their implementation creates a permanent market failure that remains active as the no-transition tool keeps working in a non-transition friendly way. Fourth, it was mentioned that the zone where all these no-transition tools can be placed is called the critical pollution production problem solving impossibility zone, as no tool in this zone is geared to fully solve the pollution production problem. Fifth, it was indicated that a clear goal, and a pollution reduction tool proper for that goal and the closing of a technology gap in line with that specific goal can solve the problem. And sixth, the point where solution is possible is called the critical problem-solving possibility point, here there is no pollution production-based market failure as the pollution problem is internalized in the proper transition tool.

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Muñoz, Lucio, 2025. **Environmental sustainability thought 102: The theory of how to link the critical pollution production generation problem with the critical pollution production solving problem step by step to point out expected problem solutions and failures? What are the implications of doing this?**. In ***CEBEM-REDESMA Boletin***, Año 19, Nº 10, October, La Paz, Bolivia.