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**Perfect Green Markets vrs Dwarf Green Markets: Did We Start Trying to Solve the Environmental Crisis in 2012 With the Wrong Green Foot? If Yes, How Can This Situation Be Corrected?**

By

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**ABSTRACT**

We shifted from the traditional market model to the green market model in 2012 to address the environmental crisis head on, but apparently we started with the wrong green foot, a dwarf green foot. We are supposed to be dealing with the environmental crisis through perfect green markets, environment and economy partnership based perfect markets where environmental issues are internalized in the pricing mechanism of the market, the green market price. For this reason the green market is cleared by the green market price. Therefore, the perfect green market thinking was the right green foot to use from the beginning to address the environmental crisis directly as we shifted from perfect traditional market thinking to perfect green market thinking, but instead of doing this it seems like those leading the paradigm shift since 2012 have moved away from perfect green market thinking and run towards dwarf green market thinking, a world where markets are unconnected to the green market price mechanism as they are still treating environmental issues as externalities. And this is a clear violation of the theory-practice consistency principle, the traditional perfect market can be cleared only by the traditional market price and therefore the perfect green market can only be cleared by the green market price, and if this is not the case, then you have a dwarf market or distorted market, an inefficient market. In other words those leading the development agenda seem to be using dwarf green market instead of perfect green market thinking in response to the environmental crisis; and therefore we are dealing with this crisis in a very inefficient and distorting way as environmental externalities are not yet internalized. The discussion above raises the questions: Did we start trying to solve the environmental crisis in 2012 with the wrong green foot? If yes, why and which are the implications of this? And how can this situation be corrected? Among the goals of this paper is to provide an answer to those questions.

**Key Words:** Perfect markets, dwarf markets, green markets, traditional market, sustainability market, Environmental crisis, externalities, internalities, exogenous issues, endogenous issues, paradigm shift, dwarf market zones, sustainability gaps, and voluntary standards.

## Introduction

### a) Linking externality assumptions and paradigm evolution

Let's assume that it is possible to see the history of economic development in old capitalist countries as having three components, a perfect sustainability market(SM), a perfect traditional market(TM), and a perfect green market(GM) each of them linked to the other by a specific set of assumptions that when implemented lead to paradigm shift from perfect market to perfect market. This situation can be appreciated in Figure 1 below:

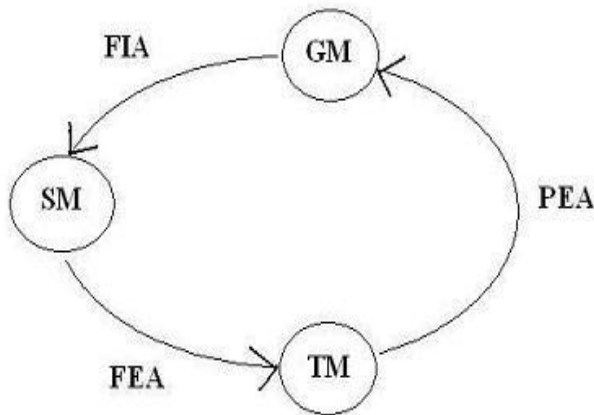


Figure 1 Perfect Market evolution path: It has three components each linked by specific set of assumptions.

Based on Figure 1 above we can look step by step how these evolution from perfect market to perfect market has taken place so far while taking a peek into the future. We can see in Figure 1 above that i) the perfect sustainability market(SM) is linked to the perfect traditional market(TM) by a full externality assumption(FEA) as perfect traditional market assumed full social and environmental externality neutrality; ii) that the perfect traditional market(TM) is linked

to the perfect green market(GM) by a partial externality assumption(PEA) as green markets assume that only social issues are externalities as now environmental issues are endogenous issues: and iii) that the perfect green market(GM) is linked to the perfect sustainability market(SM) by a full internality assumption(FIA) as now social issues, not just environmental issues, are endogenous issues to the perfect sustainability market model. The Figure 1 above can be used to support the idea that we are moving towards sustainability step by step(Muñoz 2015a) as sustainability seems to be at the end of paradigm evolution(Muñoz 2013). The structure of each of these perfect markets in this perfect market evolution path is described in detail below.

#### i) The perfect sustainability market

The sustainability market is a fully inclusive market where social and environmental issues are endogenous issues reflected in the price structure of sustainability markets(Muñoz 2012a).

The sustainability market can be stated graphically as follows:

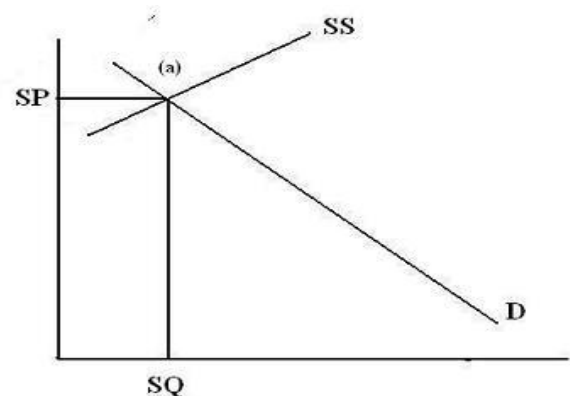


Figure 2 The perfect sustainability market: It is cleared by the sustainability price(SP) at the sustainability quantity (SQ)

We can see from Figure 2 above that the perfect sustainability market(SM) is cleared by the sustainability market price(SP) at the sustainability quantity(SQ). The sustainability market price(SP) sends the correct signal to socially and environmentally friendly firms, consumers, and economies. In this market there is a socially and environmentally friendly economic agent to be known as the sustainability man. And therefore, sustainability markets need to be based on the theory of the socially and environmentally responsible firms and consumers(Sustainability based microeconomics) and on the theory of the socially and environmentally friendly economy (Sustainability based macroeconomics). The fact that traditional economic thinking would not work in this market is known now as the sustainability market knowledge gap(Muñoz 2016a).

### ii) *The perfect traditional market*

It has been recently highlighted that Adam Smith could have stated the structure of the sustainability market in 1776 when he published “The Wealth of Nations” instead of giving us the traditional market, but apparently he missed the opportunity(Muñoz 2015b).. Had Adam Smith stated the perfect sustainability market(SM) it would have looked like the one in Figure 2 above, but instead he stated the perfect traditional market(TM) as shown in Figure 3 below:

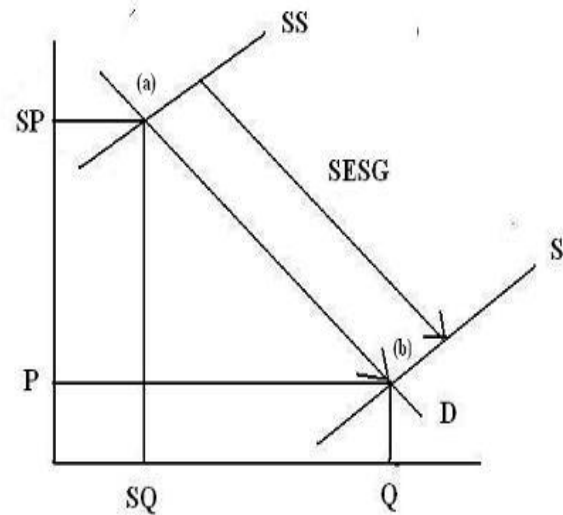


Figure 3 The perfect traditional market(TM): It is cleared by the traditional price(P) at the traditional quantity(Q).

We can see from Figure 3 above that the perfect traditional market(TM) is cleared by the traditional market price(P) at the traditional quantity(Q). The traditional market price(P) sends the correct signal to firms, consumers, and economies. In this market there is an economic agent known as the economic man. And therefore, traditional markets are based on the theory of firms and consumers(microeconomics) and on the theory of the traditional economy(macroeconomics).

We can also see from Figure 3 above the following: i) That when stating the perfect traditional market(TM) Adam Smith created a socio-environmental sustainability gap(SESG) that goes from point (a) to point (b); ii) that making that full externality assumption allowed the traditional market to produce and consume way above the sustainability quantity as  $Q > SQ$  as not accounting for the social and environmental externalities brings the traditional market price below the sustainability market price as  $P < SP$ ; and iii) that producing at the

lowest price in the long term has encouraged or should be expected to encourage or it should have been expected to encourage over production and over consumption. It has been stressed that the traditional market model was a fully distorted market since it was stated (Muñoz 2010). Therefore, it can be said that the traditional market (TM) was based on the theory of the socially and environmentally irresponsible firms and consumers (traditional microeconomics) and on the theory of the socially and environmentally unfriendly economy (traditional macroeconomics).

### iii) *The perfect green market*

In 1987 the Bruntland Commission (WCED 1987) took issue with the need to correct the traditional market model to internalize or reflect social and environmental concerns leading in 2012 to the paradigm shift to green markets (UNCSD 2012a: 2012b) partially fulfilling the Bruntland Commission request as these green markets only internalized environmental concerns. The shift to green markets (GM) comes from the correction made to the structure of traditional market (TM) to internalize environmental concerns. The structure of the shift from the traditional market (TM) to the green market (GM) can be appreciated in detail in Figure 4 below:

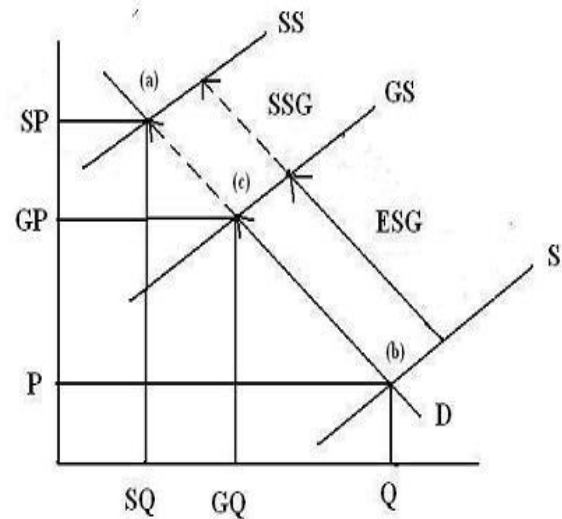


Figure 4 The perfect green market: It is cleared by the green market price (GP) at the green quantity (GQ).

We can see from Figure 4 above that the perfect green market (GM) is cleared by the green market price (GP) at the green quantity (GQ). The green market price (GP) sends the correct signal to green firms, green consumers, and green economies. In this market there is an economic agent known as the green economic man. And therefore, green markets are based on the theory of environmentally friendly firms and consumers (green microeconomics) and on the theory of the environmentally friendly economy (green macroeconomics).

We can also see from Figure 4 above the following: i) That when correcting the perfect traditional market (TM) to reflect environmental concerns it shifts from point (b) to point (c) fully closing its environmental sustainability gap (ESG) and becoming the perfect green market (GM); ii) that making this partial correction allows the green market (GM) to produce and consume way below the traditional quantity as  $GQ < Q$  as accounting for environmental externalities brings the green market price above the traditional market price as  $GP >$

P; and iii) that producing at a higher price in the long term will encourage or should be expected to encourage more responsible production and consumption under green markets.

Notice also in Figure 4 above the following: i) that the shift from traditional market(TM) to green markets(GM) means that traditional microeconomic and macroeconomic knowledge is left behind and it no longer work unless updated to green microeconomics and green macroeconomics what it is now known as the green market knowledge gap(Muñoz 2016b ); ii) that green markets(GM) are affected by social sustainability gaps(SSG) as social issues are exogenous to the model; and iii) environmental issues are now internalized in the pricing mechanism of perfect green markets so they are not longer externalities. The general structure of the perfect green market was recently highlighted(Muñoz 2016c).

**iv) Closing the perfect market shift circle**

If in the future there is a need to make green markets(GM) fully socially friendly they will need to be corrected to internalize social issues in the price mechanism and when doing so perfect sustainability markets will be created.

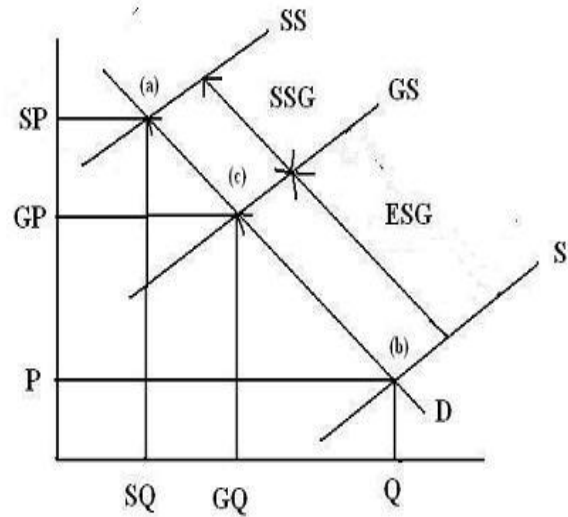


Figure 5 The perfect sustainability market: When the green market(GM) closes its social sustainability gap(SSG) it shifts from GS to SS, the world of sustainability markets(SM)

We can see from Figure 5 above that the perfect sustainability market(SM) is cleared by the sustainability market price(SP) at the sustainability quantity(SQ). The sustainability market price(SP) sends the correct signal to socially friendly green firms, green consumers, and green economies. In this market there is an economic agent known as the sustainability man. And therefore, sustainability markets are based on the theory of socially and environmentally friendly firms and consumers(sustainability based microeconomics) and on the theory of the socially and environmentally friendly economy(sustainability based macroeconomics).

We can also see from Figure 5 above the following: i) That when correcting the perfect green market(GM) to reflect social concerns it shifts from point (c) to point (a) fully closing its social sustainability gap(SSG) an becoming the perfect sustainability market(SM); ii) that making

this partial correction to green markets(GM) allows the sustainability market(SM) to produce and consume way below the green quantity as  $SQ < GQ$  as accounting for social externalities brings the sustainability market price above the green market price as  $SP > GP$ ; and iii) that producing at a higher price in the long term will encourage or should be expected to encourage socially responsible green production and consumption.

Notice also in Figure 5 above the following: i) that the shift from green markets(GM) to sustainability markets(SM) means that green or traditional microeconomic and green or traditional macroeconomic knowledge is left behind and it no longer works unless updated to sustainability based microeconomics and sustainability based macroeconomics to close the sustainability market knowledge gap; ii) that sustainability markets(SM) are not affected by sustainability gaps as they are fully inclusive models; and iii) Social and environmental issues are now internalized in the price mechanism of perfect sustainability markets(SM). The general structure of the perfect sustainability market was recently pointed out in detail(Muñoz 2016d).

**b) Linking perfect markets and issue/price internalization**

Correcting the perfect traditional market(TM) could have been done in at least two ways: i) by fully internalizing both social and environmental concerns at the same time and shift towards the perfect sustainability market(SM) directly; and ii) by internalizing environmental concerns only and shifting towards perfect green

markets(GM). Therefore, the road back to perfect sustainability markets(SM) since full internalization was bypassed in 2012 is possible now only after correcting the perfect green market(GM) to reflect social issues and shift towards perfect sustainability markets(SM). In all cases above we move from perfect market to perfect market, each of them reflecting the issues internalized in their respective pricing mechanism. This can be appreciated in Figure 6 below:

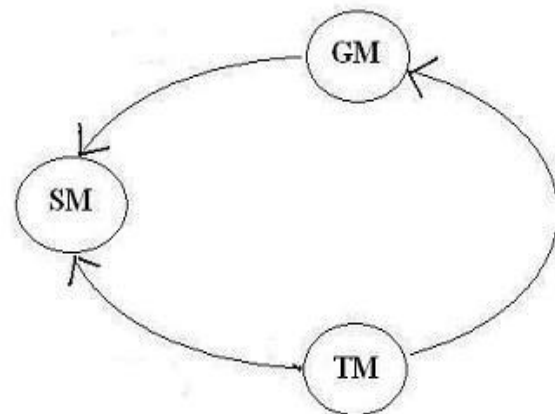


Figure 6 Perfect market evolution path after correcting the traditional market(TM) at once or step by step

We can indicate based on Figure 6 above the following: i) that internalizing social and environmental issues in the pricing mechanism of the traditional perfect market model(TM) at the same time shifts it towards perfect sustainability markets(SM); ii) that internalizing only social issues in the pricing mechanism of the traditional perfect market model(TM) shifts it towards the perfect green market model(GM); and iii) that internalizing social issues in the pricing mechanism of the perfect green market model(GM) shifts it towards the perfect sustainability market model(SM). And when doing this we are correcting distorted

markets(Muñoz 2012a) by fully closing sustainability gaps in ways consistent with paradigm shift expectations(Muñoz 2016e).

### c) Linking perfect markets and dwarf market zones

Perfect markets respect the theory-practice consistency principle, supply and demand interactions can only be cleared at that specific perfect market price for example only perfect market prices clear perfect markets. Dwarf markets are markets that clear at a price different than perfect market prices as keeping issues as externalities allows them to produce at lower prices; and they are placed between perfect markets indicating that their pricing mechanism does not reflect full perfect prices. Dwarf markets zones are the areas found between two perfect markets. This can be visualized clearly in Figure 7 below:

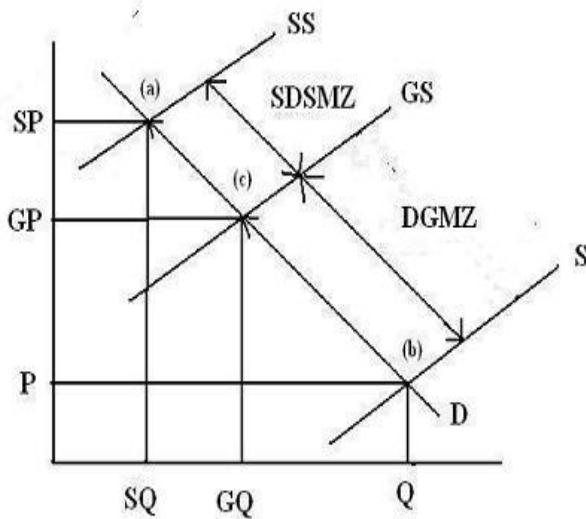


Figure 7 Dwarf market zones: The dwarf green market zone(DGMZ) is found between green supply(GS) and traditional supply(S) from point (c) to point (b). The short dwarf sustainability market zone(SDSMZ) is found between the sustainability market supply(SS) and the green market supply(GS) from point (a) to point (c).

Figure 7 above shows two dwarf market zones(DMZ) clearly i) the short dwarf sustainability market zone(SDSMZ) found between point (a) and point (c) as any green market(GM) placed below point (a) is a dwarf sustainability market(DSM) because it is not cleared by the sustainability market price(SP) ; and therefore it will be still affected by a social sustainability gap(SSG) as social issues would be still not fully internalized; ii) the dwarf green market zone(DGMZ) found between point (c) and point (b) as any traditional market(TM) placed below point (c) is a dwarf green market(DGM) because it is not cleared by the green market price(GP) ; and therefore it will be still affected by an environmental sustainability gap(ESG) as environmental issues are not yet internalized in their pricing mechanism;

Notice that we can also use Figure 6 above to highlight the dwarf market zones(DMZ): i) the arrow between the perfect traditional market(TM) and the perfect sustainability market(SM) represent the long dwarf sustainability market zone(LDSMZ) as any traditional market(TM) placed below the perfect sustainability market(SM) or sustainability market price(SP) is a dwarf sustainability market(DSM); ii) the arrow between the perfect traditional market(TM) and the perfect green market(GM) represent the dwarf green market zone(DGMZ) as any traditional market(TM) placed below the perfect green market(GM) or green market price(GP) is a dwarf green market(DGM); and iii) the arrow between the perfect green market(GM) and the perfect sustainability market(SM) represent the short dwarf sustainability market zone(SDSMZ) as any green market(GM)

placed below the perfect sustainability market(SM) or sustainability market price(SP) is a dwarf sustainability market(DSM). Understanding these dwarf market zones is important to understand what to expect from the dwarf green market approaches being used today to address the environmental crisis as we are supposed to be living now under full flesh green economies a la low carbon(OECD 2015a; 2015b;2015c;2015d;2015e).

#### **d) Perfect green market vrs dwarf green market discourse**

We shifted towards perfect green market thinking in 2012 as mentioned before so we are now in the green economy world(WB 2012;2016) and therefore, we should have used perfect green market theory to set up green economies since then, but instead of doing that those leading the paradigm shift to green markets decided to go the dwarf green market route as the best way to deal with environmental issues, which was clearly a big mistake that will need to be corrected very soon. The world of the green economy and of green growth is a partnership based world where environmental issues are now endogenous issues as environmental concerns are internalized in the pricing mechanism of perfect green markets. In these green markets we should expect or know that standard microeconomic and macroeconomic theories do not work as now the green economic man is in charge and he needs green microeconomics and green macroeconomics to do his job as required by perfect green market thinking.

However instead of internalizing environmental externalities in the pricing

mechanism of green markets the mainstream thinkers and policy makers at the UN and beyond have gone to deal with environmental issues still as externalities creating in the process dwarf green markets: Markets which operate outside the perfect green market pricing mechanism distorting in the process perfect market thinking encouraging us to produce and consume far away from perfect green market requirements.

In summary, we shifted to the theory of green markets, green economy, and green growth in 2012 and instead of dealing with the environmental crisis within perfect green market thinking, perfect green economy thinking and perfect green growth thinking since then we have and are dealing with it using dwarf green market, dwarf green economy, and dwarf green growth thinking. And this means that we have been dealing with the environmental crisis and the reporting of economic activity through non green market means in practice while saying that in theory we are in the green market world. Therefore, there is a huge inconsistency in theory-practice both in modeling and the reporting of economic activity since 2012, we are in a green world, but we are modeling and reporting its development as if we are in a non-green world, where are we then? Two examples of these inconsistencies are provided below, they reflect a total mismatch between the theory we are supposed to be using(perfect green market thinking) and the practice being used(dwarf green markets) since we shifted in 2012 from traditional markets to green markets and green economies:



***i) Example one: The case of UNDESA:***

We are supposed to be operating under green markets(UNCSD 2012a; 2012b) since 2012 Rio + 20 shift to green markets as mentioned before. We have even been giving clear ideas on how to move towards the green economy by UNDESA(UNDESA 2012) without leaving no one behind(UNDESA 2016a), yet in all reports about global economic prospects provided by UNDESA after the shift(UNDESA 2013; 2014; 2015; 2016b) they do not express their economic views or economic activity in terms of the green economy and green growth, but in terms of the old economy and old growth thoughts(UNDESA 2010: 2011), which the 2012 paradigm shift from traditional market to green market has left behind(Muñoz 2016a).

And therefore it can be said that since the old economic thinking does not longer work within green markets so from the green market point of view those UNDESA outlook reports published after the 2012 paradigm shift to green markets listed above are in a sense dwarf green market outlooks or reports.

***ii) Example two: The case of the State of Sustainability Initiative(SSI):***

Voluntary sustainability standards are being used to encourage the move of traditional markets towards the green economy; and therefore make them environmentally friendly. In Figure 1.1 in Box 1.1 in page 22 of the State of the Sustainability Initiative review(IISD and IIED 2014) you can find the voluntary sustainability standard framework(VSSF) used by thinkers in these organizations as a move to produce less to

pollute less. You can see in Figure 1.1 there that the voluntary sustainability standard supply(VSS) of their voluntary sustainability standard framework(VSSF) is placed just below the perfectly sustainable supply curve(PS) or perfect green market supply; and therefore it is located between the perfect green market supply(VSS) and the old traditional market supply(C); and this makes the voluntary sustainability standard framework(VSSF) a dwarf green market framework according to Figure 7 above as it falls within the dwarf green market zone(DGMZ). In other words the VSSF is a dwarf market because the voluntary price(Psvv) clearing that voluntary standards market is not a perfect green market price(GP). In other words environmental issues in that VSSF framework are not internalized in the price P<sub>vss</sub> making this price lower than perfect green market prices allowing the production and consumption of Q<sub>vss</sub> to be higher than it would be if this was a perfect green market framework. And this dwarf green market thinking is being used to support global green growth programs(UNIDO and GGGI 2015 ) and even full continent industrialization processes(UNECA 2016).

And therefore, environmental externalities are not internalized in this voluntary standard framework(VSSF) in their pricing mechanism placing the voluntary price(P<sub>vss</sub>), voluntary production(Q<sub>vss</sub>) and voluntary consumption(Q<sub>vss</sub>) away from perfect green market thinking; and this makes dwarf green markets including the VSS market inefficient markets. In other words, voluntary sustainability standards(VSS) are distorting perfect green market thinking as they are operating under

dwarf green market price, dwarf consumption, and dwarf production since environmental issues are still treated as externalities and therefore they are not internalized in their pricing mechanism. Hence the practice used to deal with environmental issues since 2012 to now do not match the theory of perfect green markets that is supposed to be ruling green economies and green growth since the paradigm shift to green markets. And this mismatch between perfect green market theory and dwarf green market practice increases the likelihood that we will push development from traditional sweatshops to dwarf green sweatshops. The structure of green sweatshops and their environmental and social consequences and policy implications have been highlighted recently (Muñoz 2012b).

The discussion above raises the questions: Did we start trying to solve the environmental crises in 2012 with the wrong green foot? If yes, why and which are the implications of this?. And how can this situation be corrected so that the practice matches the theory of perfect green markets? Among the goals of this paper is to provide an answer to those questions.

## Objectives

a) To highlight the structure of the perfect green markets and the main implications of this structure; b) To point out the structure of dwarf green markets and relevant implications of this structure; c) To point out how dwarf green markets can be transformed into perfect green markets, and d) To use the frameworks above to point out why we started dealing with the environmental crisis since 2012 with the

green wrong foot after the paradigm shift to green markets, to show that the current dwarf market practice does not match the theory of perfect green markets, and to emphasize that we must correct the situation as soon as possible if we wish to address the environmental crisis efficiently.

## Methodology

First the terminology used in this paper is listed. Second, some operational concepts are provided. Third, the structure of the perfect green market and its main theoretical and practical implications are highlighted. Fourth, the structure of the dwarf market and its main theoretical and practical implications are pointed out. Fifth, the structure of perfect green markets and dwarf green markets are compared to highlight theoretical and practical inconsistencies making dwarf markets inefficient markets. Sixth, ideas on how to correct dwarf green markets and transform them into perfect green markets are given in a detailed framework. And finally, some food for thoughts and relevant conclusions are shared.

## Terminology

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D = Traditional demand	S = Traditional supply
TM = Traditional market	P = Traditional Market price
Q = Traditional quantity	GD = Green demand
GS = Green supply	GM = Green market
GP = Green price	GQ = Green quantity
SD = Sustainability demand	SS = Sustainability supply
SM = Sustainability market	SP = Sustainability price
SQ = Sustainability quantity	SSG = Social sustainability gap
ESG = Environmental sustainability gap	DD = Dwarf demand
DS = Dwarf supply	DM = Dwarf market
DP = Dwarf price	DQ = Dwarf quantity

DMZ = Dwarf market zone

DSM = Dwarf sustainability market

DGMZ = Dwarf green market zone SDSMZ = Short dwarf sustainability market zone

DGM = Dwarf green market LDSMZ = Long dwarf sustainability market zone

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### Operational concepts

i) **The traditional market(TM)**, the economy only market, a full exclusion market

ii) **The traditional market price(P)**, the price clearing the perfect traditional market

iii) **The traditional quantity(Q)**, the efficient quantity produced and consumed in perfect traditional markets

iv) **The green market(GM)**, the environmentally friendly economy market, a partnership based market

v) **The green market price(GP)**, the price clearing the perfect green market

vi) **The green quantity(GQ)**, the efficient quantity produced and consumed in perfect green markets

vii) **The sustainability market(SM)**, a socially and environmentally friendly economy market, a full inclusion market

viii) **The sustainability market price(SP)**, the price clearing the perfect sustainability market

ix) **The sustainability quantity(SQ)**, the efficient quantity produced and consumed in perfect sustainability markets

x) **The dwarf market(DM)**, a false market, a market unconnected to perfect market pricing, it looks like it is a specific market, but it is not.

xi) **The dwarf market price(DP)**, the price clearing the dwarf market

xii) **The dwarf quantity(DQ)**, the inefficient quantity produced and consumed in dwarf markets

xiii) **Dwarf market zone(DMZ)**, the area where dwarf markets are or can be located

xiv) **Dwarf green market(DGM)**, any traditional market(TM) located below the perfect green market price(GP).

xv) **Dwarf sustainability market(DSM)**, any traditional market(TM) or any green market(GM) located below the perfect sustainability market price(SP)

### The structure of the perfect green market

Perfect green markets(GM) are markets where environmentally friendly producers and environmentally friendly consumers meet and they are cleared by the perfect green market price(GP), a situation described in Figure 8 below:

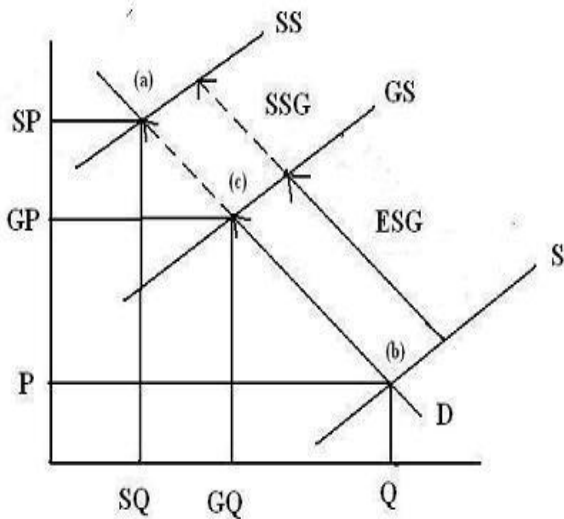


Figure 8 The characteristic of the perfect green market: To the left of point (c) it shows a social sustainability gap(SSG) or social externality and to the right of point (c) it shows a fully closed or fully internalized environmental sustainability gap(ESG).

The following main characteristics of the structure of perfect green markets(GM) can be extracted from Figure 8 above: i) The market is cleared at point (c) where the green market price(GP) clears the perfect green market(GM) and the perfect green market quantity GQ is produced and consumed; ii) To the left of point (c) from point (c) to point (a) the broken arrow indicates the existence of a social sustainability gap(SSG) affecting perfect green markets(GM); iii) To the right of point (c) the continuous arrow from point (b) to point (c) indicates that there is no longer an environmental sustainability gap(ESG) in perfect green markets(GM) as environmental issues are now endogenous issues reflected in the green price mechanism (GP) of the perfect green market(GM); iv) when environmental issues are fully internalized in the pricing mechanism the traditional supply(S) of the traditional perfect markets(TM) shifts from point (b) to point (c) and becomes the green

market supply(GS) of the perfect green market(GM) as now environmental externalities have been internalized; and v) The green supply(GS) and green consumers are very responsive to changes in the green price(GP) as the green price(GP) sends the right signal affecting the behavior of green producers and green consumers to produce and consume the perfect green market quantity(GQ).

### The structure of the dwarf green market

Dwarf green markets(DGM) are markets still operating under environmental externalities and therefore they have a price mechanism unconnected to the perfect green market pricing(GP) as they are cleared by a dwarf market price(DP), a situation described in Figure 9 below:

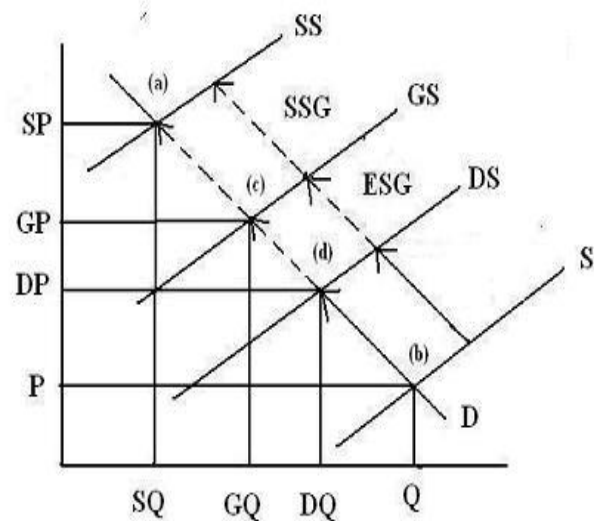


Figure 9 The structure of dwarf green markets: They are cleared by the dwarf price(DP) at the dwarf quantity(DQ) at the point where there is still an environmental sustainability gap as environmental issues are treated still as externalities and not yet internalized in the model as they should be.

The main characteristics of the structure of dwarf green markets(DGM) can be derived from Figure 9 above: i) The dwarf market is cleared at point (d) where the dwarf market

price(DP) clears the dwarf green market(DGM) and the dwarf quantity DQ is produced and consumed; ii) To the left of point (d) from point (c) to point (a) the broken arrow indicates the existence of a social sustainability gap(SSG) affecting the dwarf green markets(DGM); iii) To the left of point (d) from point (d) to point (c) the broken arrow indicates the existence of an environmental sustainability gap(ESG) affecting the dwarf green markets(DGM) and placing them outside perfect green market(GM) thinking as they have not internalized environmental issues in their pricing mechanism; iv) To the right of point (d) the continuous arrow from point (b) to point (d) indicates a shift from the traditional market supply(S) to the dwarf green market supply(DS) due to voluntary or regulatory actions; v) when environmental issues are still outside the pricing mechanism and the only goal is to produce and consume less than what was being produced and consumed in the traditional market(TM) then the traditional supply(S) of the traditional perfect market(TM) shifts from point (b) to point (d) and it becomes the dwarf market supply(DS) of the dwarf green market(DGM) as now environmental externalities are not internalized in the pricing mechanism; and vi) The dwarf supply(DS) sends a strong signal affecting the behavior of producers and consumers to produce and consume away from the perfect green market quantity(GQ) encouraging to produce and consume more than what they would produce and consume under perfect green markets(GM) as the dwarf price(DP) is lower than the green price(GP). And therefore, if we do not internalize environmental externalities we will always produce more than the green quantity GQ.

Notice that all those characteristic mentioned above applied to the voluntary sustainability standard framework(VSSF) used in the State of Sustainability Initiative Standards(IISD and IIED 2014) mentioned in the introduction as they are dwarf markets since if we make VSS supply = dwarf supply DS in Figure 9 above then the characteristics and expectations of dwarf markets apply to the VSSF framework.

### Acting in violation of the theory-practice consistency principle

Figure 8 represent the theory(perfect green market thinking) that we were supposed to use since 2012 when we shifted to green markets; and Figure 9 reflects the practice(dwarf market based thinking) that we followed instead. And this creates a theory-practice problem as we are using an imperfect practice instead of the perfect one, the one based on perfect green market thinking. The table below summarizes the main inconsistencies that exist between the perfect practice under perfect green markets and the imperfect practice under dwarf green markets with respect to the ways in which they treat environmental issues:

Market inconsistencies		
Environmental issues	Perfect green markets	Dwarf green markets
Type of issues	Endogenous	Exogenous
Type of correction	Internalization	Externalization
Type of price	Perfect price	Imperfect price
Type of quantity	Efficient quantity	Inefficient quantity

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Part of pricing mechanism            Yes                            No  
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Need green taxes                            No                            Yes  
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Can green market issues be solved efficiently with non-green market tools such as dwarf green markets, the theory-practice consistency principle says “No”. Therefore, the theory, perfect green market theory, does not match the practice of using dwarf market thinking and this is a clear violation of the theory-practice consistency principle, the theory must match the practice, perfect green market theory, perfect green market practice. As dwarf market practice is not perfect green market practice and therefore dwarf market practice is the wrong green tool to seriously address environmental issues. The use of use of green markets may have been either an honest mistake due to the green market paradigm shift knowledge gap or an act of willful academic blindness or bias as the theory of perfect green market is clear. Whatever the case it needs to be corrected as soon as possible if we are serious about dealing with environmental issues efficiently. Otherwise, the use of dwarf green markets will soon water down the claim that our actions and methods should reflect sound and unbiased scientific or academic thinking and destroy faith in the scientific method where the respect of the theory-practice consistency principle is paramount.

In summary, using dwarf markets since 2012 means we started dealing with environmental issues with the wrong green foot, a dwarf green foot encouraging in the process production and consumption processes outside the green market price

mechanism. We should have been using perfect green market theory and practice from the beginning as this is the right green foot to encourage perfect green markets production and consumption levels. And this situation needs to be corrected as soon as possible to restore the respect for the theory-practice consistency principle.

### **Transforming dwarf green markets into perfect green markets**

There are three possible solutions to the situation created by the widespread use of dwarf green markets(DGM) since 2012, voluntary internalization, legislative internalization, and a mixed internalization approach. The result of using any of them would be in the end the same, the transformation of the dwarf supply(DS) into the perfect green market supply(GS) as environmental issues are internalized in the pricing mechanism closing the environmental sustainability gap(ESG), a situation that can be appreciated in Figure 10 below:

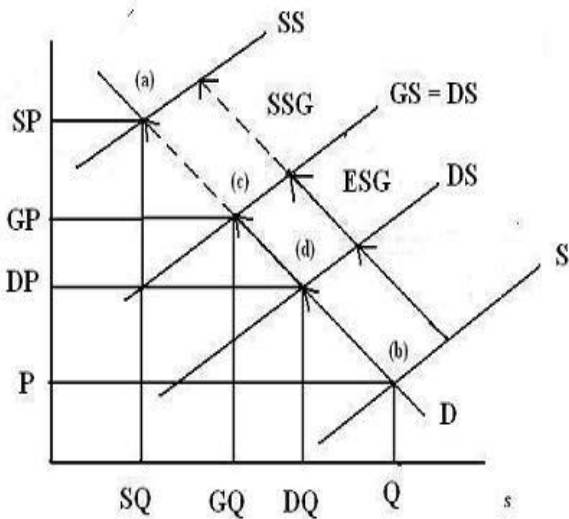


Figure 10 Fully internalizing environmental externalities: When the dwarf green market(DS) fully internalizes environmental externalities to be cleared by the green price GP, it shifts to the left taking the same structure of the perfect green market. Now  $DP = GP$  and  $DQ = GQ$

It can be seen clearly in Figure 10 above that i) when the environmental sustainability gap(ESG) is closed due to price internalization the dwarf market supply(DS) shifts from point (d) to point (c) reducing the quantity produced from DQ to GQ where  $DP = GP$  now and then perfect green market(GM) thinking rules again; ii) green producers and green consumers will respond to the signals sent by the green price; and iii) when doing this the respect of the theory-practice consistency principle is restored.

Notice that all those corrections mentioned above applied to the voluntary sustainability standard framework(VSSF) used in the State of Sustainability Initiative Standards(IISD and IIED 2014) mentioned in the introduction as they would be then corrected dwarf markets since if we make VSS supply = DS = GS in Figure 10 above then the corrected VSS market becomes the perfect green market(GM) producing the perfect

green market quantity(GQ) at the green market price(GP).

### Food for thoughts

- i) Would green taxes distort perfect green markets?, I say yes, what do you think?
- ii) If consumers and producer pay green taxes, are they living under green markets?, I say no, what do you think?
- iii) Can green market problems be solved with non-green market tools?. I say no, what do you think?
- iv) Is there a green economy if we do not have green markets? I say no, what do you think?

v) Can green taxes on the traditional market production transform growth into green growth?. I say no, what do you think?

### Conclusions

First, the structure of the perfect green market, an efficient market; and the structure of dwarf green market, an inefficient market, were highlighted in detail and compared. Second, it was then pointed out that trying to deal with the environmental crisis using dwarf market thinking instead of perfect green market thinking was and is a mistake as dwarf green markets are not efficient tools for that job: they encourage production and consumption levels way above what they would be under perfect green markets as by not internalizing environmental issues in their prices mechanism they can only deal with them as externalities.

Third, it was indicated that the right tool to use from the beginning in 2012 was the perfect green market thinking which requires the internalization of environmental issues in the pricing mechanism of green markets so that green prices can send the right signal to green producer and green consumer to produce and consume the efficient green quantity. Fourth, it was stressed that this theory-practice inconsistency needs to be corrected as soon as possible and a framework was shared showing how this correction can be done. And finally, it was added that implementing non-green markets as green markets will, if the situation is not corrected soon, lead to the erosion in the confidence on unbiased science and scientific method based market approaches as you cannot act in full violation of the theory-practice consistency principle for ever.

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