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## The Present Versus the Future in Development Thinking: Towards Agricultural Sustainability

By

Lucio Muñoz\*

\* Independent Qualitative Comparative Researcher/Consultant Email: [munoz@interchange.ubc.ca](mailto:munoz@interchange.ubc.ca)

### Abstract

There is currently widespread agreement, locally and internationally, on the need to ensure that development meets strict environmental standards for the benefit of the present and future generations. And therefore, there is agreement on the need to stop assuming that environmental issues are exogenous issues to the economic model as in reality they are endogenous issues capable of affecting production and consumptions decisions. While the inclusion of environmental concerns to create an eco-economic model in general; and an eco-agricultural model, in particular, is a positive step towards sustainability, it does not leads to true sustainability as those models are assumed to be social externality neutral. One of the main goals of this paper is to point out the structure of the general sustainability model and of the agricultural sustainability model, both when closed and opened, to highlight the local and non-local development implications resulting from ensuring that green development models account for binding social externalities.

### Introduction

#### i) The present versus the future in development action

It can be said that currently the dominant development concern for governments and international organizations is to make sure that we can create a model in which the economy can grow while having no environmental impact or having the lowest environmental impact possible. And therefore, political and institutional actions have moved in this direction. For example, developed countries just recently agreed to embrace green growth based development(OECD 2009) and are leading their business community towards a transition to low carbon based development(OECD 2010). The World Bank just recently carried an evaluation of 10 years of experiences financing low carbon development(WB 2009b) determining that carbon markets can play now even a better role in green house mitigation strategies to combat climate change.

In other words, today environmentally neutral or low environmental impact development or eco-economic development locally and globally is the most desirable form of general

development and agricultural development because it allows us to balance both economic and environmental concerns at the same time creating in the process general green markets and agricultural green markets or eco-economic markets. Developing countries such as Mexico are now actively seeking ways to join the low carbon model(WB 2009a), a trend that other developing countries will for sure follow now that the World Bank is willing to finance their carbon programs or markets(WB 2010). The structure of green markets and their development implications on producers, consumers, and trade was pointed out recently(Muñoz 2010a).

However, true sustainability suggest that as long as development is not socially friendly it should be expected to be unsustainable; and since those green markets or eco-economic models being promoted today assume that they are social externality neutral, they are bound, especially in the long-term, to be subjected to even extreme social unsustainability. We cannot expect the economic and environmental components of the millennium development goals to be achieved through socially unfriendly eco-economic approaches. The millennium development goals must be handled together in ways that reaching one goal does not hindered the success of the other to be consistent with sustainability principles, yet they are listed, described, and monitored in isolation(UN 2010). Muñoz(2003) pointed out the need to lead eco-economic models towards sustainability by making them socially friendly.

## **ii) The need to go beyond green economic development**

Just as it took a chain of worsening environmental crises for traditional economic approaches to accept that environmental externalities should be taken as endogenous to the economic model to avoid environmental unsustainability, and perhaps over all system collapse, it may take several extreme social crises for current eco-economic approaches to stop assuming social externality neutrality and make it an endogenous issue too and move that way towards true sustainability. Solutions to environmental problems such as climate change are apparently being implemented with an economic and environmental focus only. Agricultural activities that are now environmentally friendly only are being heavily promoted(FAO 2009) and considered smart(FAO 2010). Social friendliness is not included in those green agricultural approaches.

In other words, just as it took extreme environmental crises to induce a move from economic sustainability to eco-economic sustainability, it will take extreme social crises to perhaps force a move from eco-economic sustainability to true sustainability. See that eco-economic models or green markets are economic models corrected to reflect environmental externalities only; and therefore eco-economies or green markets are another form of distorted markets(Muñoz 2010b). There is increasing interest currently in valuing ecosystems and environmental services(EC 2008) in a formal step away from business as usual so that development can be environmentally friendly, but social friendliness is not yet part of the process.

Hence, when eco-economic models or green markets become socially friendly, then the conditions for true sustainability to exist are created. The next step after eco-economics(the markets corrected for environmental concerns) is true sustainability(the eco-economic markets corrected for social concerns). Notice that green economies are essentially sustainable development based economies or traditional economies constrained by environmental concerns. And consistent with this, ILO(2010) describes green economy as sustainable development. The dominant incentive-regulation structure of the sustainability market and of the eco-economic development market and their policy implications have been detailed(Muñoz 2000). One of the

main aims of this paper is to point out how the general green development model and the green agricultural development model would look like after reflecting social externalities.

## Goals

The goals of this paper are the following: First, to introduce the structure of the general green development model, both closed and opened, that works under the assumption of no social externalities to highlight current local and non-local development issues. Second, to present the parallel structure of the green agricultural development model, both closed and opened, which operates too under the assumption of no social externalities to highlight current local and non-local agricultural development issues.

And third, to point out the parallel structure of the general sustainability model; and of the agricultural sustainability model resulting from internalizing social issues in the general green development model and in the green agricultural model, both when closed and opened, to stress current and future local and non-local sustainability implications

## Methodology

First, the terminology used in this paper is listed. Second, some relevant operational concepts are indicated. Third, the closed general green development model is presented; and then extended to its opened form to highlight their local and non-local general implications. Fourth, the closed green agricultural development model is discussed as direct simplification of the general model; and then extended to its opened form to point out their local and non-local agricultural implications.

Fifth, the closed general sustainability model is introduced as a direct extraction from the closed general green development model after correcting it to account for social externalities; and then extended to its opened form to stress its local and non-local sustainability implications. Sixth, the closed agricultural sustainability model is pointed out as a direct extraction from the closed green agricultural development model after correcting it to account for social externalities; and then extended to its opened form to stress its local and non-local sustainability implications. And finally, some important conclusions are provided.

## Terminology

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GRM = General green resource market

GGA = General green public users

GGB = General green private users

GGC = General green consumers

GGP = Local general green price

GGP1 = General green import price

GGP2 = General green export price

GGI = General green imports

GGE = General green exports

GGM = Local general green margin

GGM1 = General import green margin	GGM2 = General export green margin
GAM = Green agricultural market	GAA = Green agricultural public users
GAB = Green agricultural private users	GAC = Green agricultural consumers
GAP = Local green agricultural price	GAP1 = Import green agricultural price
GAP2 = Exports green agricultural price	GAI = Green agricultural imports
GAE = Green agricultural exports	AGM = Local agricultural green margin
AGM1 = Imports agricultural green margin	AGM2 = Exports agricultural green margin
GGSM = General green social margin	GGSM1 = General green import social margin
GGSM2 = General green export social margin	GASM = Local green agricultural social margin
GASM1 = Import agricultural social margin	GASM2 = Export agricultural social margin
FT = Fair trade	FFTP = Full fair trade price
PFTP = Partial fair trade price	P = Traditional Market price
AP = Agricultural market price	GSP = General sustainability price
ASP = Agricultural sustainability price	

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### **Operational concepts**

Below there is a short list of operational concepts needed to help in the presentations of the ideas in this paper:

- i) General price(P), general market economic only price
- ii) Agricultural price(AP), agricultural market economic only price
- iii) General green margin(GGM), what is needed to cover the extra cost of green production
- iv) Agricultural green margin(AGM), what is needed to cover the extra cost of green agricultural production

v) General green price(GGP), the general price that reflects both the economic and the environmental cost of production.

$$GGP = P + GGM$$

The formula above says that the general green market price(GGP) is equal to the traditional market price(P) plus the general green margin(GGM).

vi) Green Agricultural price(GAP), the agricultural market price that reflects both the economic and environmental costs of production.

$$GAP = AP + AGM$$

The formula above says that the green agricultural price(GAP) is equal to the traditional agricultural market price(AP) plus the agricultural green margin(AGM).

vii) General green social margin(GGSM), what is needed to cover the extra cost of socially friendly green production.

viii) Green agriculture social margin(GASM), what is needed to cover the extra cost of socially friendly green agricultural production.

Ix) General sustainability price(GSP), the general price that reflects the cost of making green production socially friendly.

$$GSP = GGP + GGSM$$

The formula above says that the general sustainability price(GSP) is equal to the general green market price(GGP) plus the general green social margin(GGSM).

Notice that since  $GGP = P + GGM$  as indicated above, and then the following is true:

$$GSP = GGP + GGSM = P + GGM + GGSM$$

The formula above says that the general sustainability price(GSP) is equal to the traditional market price(P) plus the general green margin(GGM) plus the general green social margin(GGSM); and therefore, the general sustainability price(GSP) is the price that reflects the economic, the environmental, and the social cost of production at the same time.

x) Agricultural sustainability price(ASP), the price that reflects the cost of making green agricultural production socially friendly.

$$ASP = GAP + GASM$$

The formula above says that the agricultural sustainability price(ASP) is equal to the green agricultural market price(GAP) plus the green agricultural social margin(GASM).

Notice that since  $GAP = AP + AGM$  as indicated above, and then the following is true:

$$ASP = GAP + GASM = AP + AGM + GASM$$

The formula above says that the agricultural sustainability price(ASP) is equal to the traditional agricultural market price(AP) plus the agricultural green margin(AGM) plus the green agricultural social margin(GASM); and therefore, the agricultural sustainability price(ASP) is the price reflects the economic, the environmental, and the social cost of agricultural production at the same time.

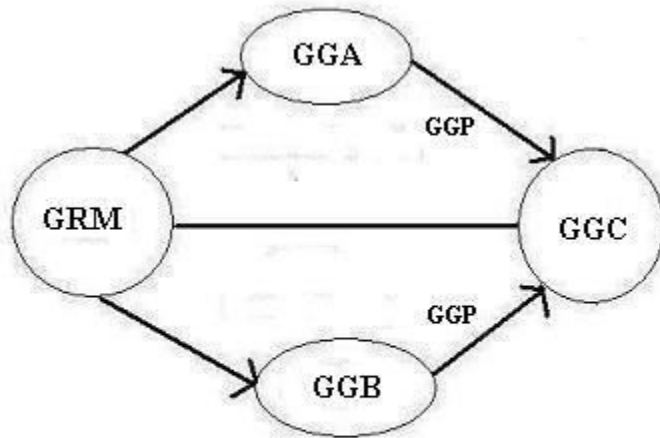
xi) Fair trade(FT), the process of altering the traditional production process by means of adding the corresponding green margin and/or social margin to the traditional general market price(P) or the agricultural market price(AP).

xii) Full fair trade price(FFTP), the traditional market price, general(P) or agricultural(AP) reflecting its corresponding green margin and social margin at the same time. Notice that the general sustainability price(GSP) and the agricultural sustainability price(ASP) are examples of full fair trade prices as they reflect both green and social margins at the same time.

xi) Partial fair trade price(PFTP), the traditional market price, general(P) or agricultural(AP) reflecting only the corresponding green margin or social margin. Notice that the general green price(GGP) and the green agricultural price(GAP) are examples of partial fair trade prices as they do not reflect social margins.

### **The general closed green development model**

If we assume that the local green resource market(GRM) can be under general green public use(GGA) and private use(GGB) at the same time to produce goods to meet the needs of only local green consumers(GGC), then we have a general closed green development model, which can be represented as follows:



**Figure 1 The closed general green development model**

### **i) Production implications**

Figure 1 above shows that facing the same general green price GGP, both green public use(GGA) and private use(GGB) producers would willingly meet the needs of local green consumers(GGC). If facing different prices, then the producer who can supply the green general market at a lower price will have a higher share of the market.

### **ii) Consumption implications**

Figure 1 above indicates that at the same general green market price GGP, green consumers(GGC) would be indifferent to buying from green public use(GGA) or green private use(GGB) producers. However, if facing different prices, then green consumers(GGC) should be expected to buy from the supplier with the lowest price.

### **iii) The social externality neutral assumption**

In the general closed green development model in Figure 1 above there are no social externality concerns as social margins are assumed not to exist; and therefore, the general green traditional market price GGP is assumed to be social externality neutral.

Noticed that the general green market price(GGP) is higher than the traditional market price(P) by the general green margin(GGM); and therefore, green consumption is expected to be lower than the previous levels of traditional consumption. Also notice that the general green price GGP is a partial fair trade price(PFTP) as it does not reflect social margins.

### **iv) Available points of market intervention**

Figure 1 above shows that it is possible to use general green social margins(GGSM) to induce directly or indirectly green public use(GGA) and/or green private use(GGB) producers to be more socially friendly when supplying the local market.

Without those general green social margin(GGSM) incentives we should not expect green producers to change behavior towards socially friendly behavior as any increase in their cost of production would lead to a loss in their market share. In other words, the use of general green social margins could be used as effective local fair trade interventions to make the general green market model(GGM) socially friendly. When adding general green social margins(GGSM)

to the general green price(GGP) we are creating a full fair trade price(FFTP) as this price reflects all externality margins.

### The general opened green development model

We can extend the closed general green development model in Figure 1 above to its opened form as follows: If we assume that local green resources(GRM) can be under green public use(GGA) and green private use(GGB) at the same time to produce goods to meet the needs of local and non-local green consumers, then we have a general opened green development model, which can be expressed as shown below:

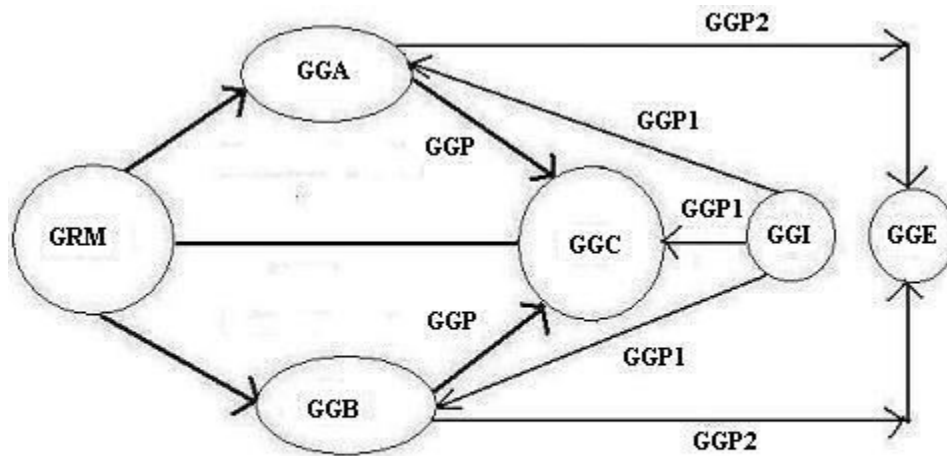


Figure 2 The opened general green development model

#### i) Export implications

Figure 2 above allows us to see that if the local general green price  $GGP >$  general green export price  $GGP2$ , producers should be expected to supply the local market. If the local general green price  $GGP =$  green export price  $GGP2$ , producers would be indifferent between supplying the local market or exporting. If the local general green price  $GGP <$  green export price  $GGP2$ , green producers should be expected to export.

#### ii) Import implications

Figure 2 above shows that if the local general green price  $GGP >$  green import price  $GGP1$ , producers should be expected to import goods for resale and consumers, especially under globalization, should be expected to import goods directly. If the local general green price  $GGP =$  green import price  $GGP1$ , producers would be indifferent between producing or importing goods; and consumers would be indifferent between consuming local goods or importing directly. If the local general green price  $GGP <$  green import price  $GGP1$ , producers should be expected not to import, and produce for the local market; and consumers should be expected to consume local goods and not import directly.

#### iii) The social externality neutral assumption

In the general opened green development model Figure 2 above there are too no social externality concerns as social margins are assumed not to exist; and therefore, the general green market price GGP as well as the green imports price GGP1 and green export price GGP2 are assumed to be social externality neutral.

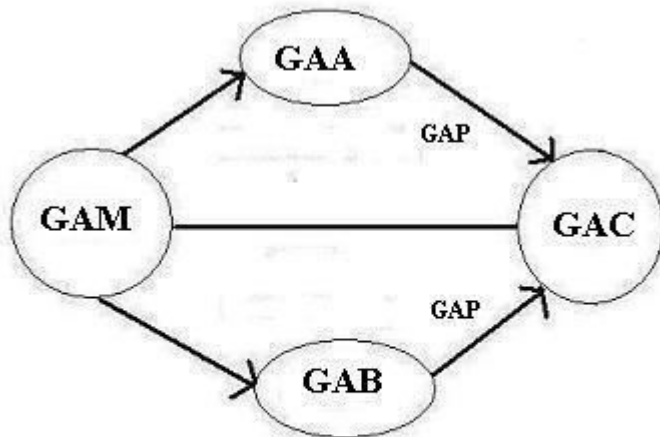
**iv) Available points of market intervention**

Figure 2 above shows that it is possible to use general green social margins(GGSM) to motivate directly or indirectly green public use(GGA) and/or green private use(GGB) producers to be more socially friendly when supplying the local and non-local market. Figure 2 also shows that we can use general green import social margins(GGSM1) and general green export social margins(GGSM2) to induce socially friendly green production too.

Without those general green social margin(GGSM) or green import social margins(GGSM1) or green export social margins(GGSM2) incentives we should not expect green producers to change behavior and be more socially friendly to supply the local and non-local market as any increase in their cost of production would lead to a loss in their market share. In other words, the use of green social margins could be used as effective local and international fair trade interventions to make the general green market model socially friendly. Notice that when adding the corresponding green social margin to the general green price(GGP), to general green import price(GGP1), and to the general green export price(GGP2) we are creating full fair trade prices(FFTP) as they reflect all externality margins.

**The closed green agricultural development model**

The greening of the old agricultural development model can be stated as follows: If we assume that local green agricultural resources(GAM) can be under green public use(GAA) and green private use(GGB) at the same time to produce goods to meet the needs of only local green agricultural consumers(GAC), then we have a closed green agricultural development model, which can be pointed out as shown below:



**Figure 3 The closed green agricultural development model**

Notice that the structure of the closed green agricultural model shown in Figure 3 above comes from directly simplifying the structure of the general closed green development model shown in Figure 1 to reflect only green agricultural issues.

### **i) Production implications**

From Figure 3 above we can say that when facing the same green agricultural market price GAP, both green public use(GAA) and green private use(GAB) producers would willingly meet the needs of local green agricultural consumers(GAC). If facing different prices, green producer who can supply the market at a lower price will have a higher share of the green agricultural market.

### **ii) Consumption implications**

According to Figure 3, at the same green agricultural market price GAP, green agricultural consumers(GAC) would be indifferent to buying from green public use(GAA) or green private use(GAB) producers. However, if facing different prices, green agricultural consumers(GAC) should be expected to buy from the supplier with the lowest green agricultural price.

### **iii) The social externality neutral assumption**

In the closed green agricultural development model in Figure 3 above there are no social externality concerns as agricultural social margins are assumed not to exist; and therefore, the green agricultural market price GAP is assumed currently to be social externality neutral.

Noticed that the green agricultural market price(GAP) is higher than the traditional agricultural market price(AP) by the agricultural green margin(AGM); and therefore, green agricultural consumption is expected to be lower than the previous levels of traditional agricultural consumption. Also notice that the green agricultural price GAP is a partial fair trade price(PFTP) because it does not reflect social margins.

### **iv) Available points of market intervention**

Figure 3 above shows that it is possible to use local green agricultural social margins(GASM) to motivate directly or indirectly green public use(GAA) and/or green private use(GAB) producers to be more socially friendly when supplying the local green agricultural market as current development thinking considers those actions market corrections, just as the internalization of agricultural green margins(AGM) are, not market distortions.

Without green agricultural social margin(GASM) incentives we should not expect green producers to change behavior towards social friendliness as any increase in their cost of agricultural production would lead to a loss in their market share.

In other words, green agricultural social margins(GASM) can be used as socially friendly fair trade interventions to encourage social friendliness within the closed green agricultural model. Again, notice that adding green agricultural social margins(GASM) to the green agricultural price(GAP) would lead to higher prices; and therefore, less consumption should be expected under a socially friendly green agricultural model. Moreover, see that adding green agricultural social margins(GASM) to the green agricultural price(GAP) leads to full fair trade pricing(FFTP).

### The opened green agricultural development model

The closed green agricultural development model in Figure 3 above can be extended to its opened form as follows: If we assume that local green agricultural resources(GAM) can be under green public use(GAA) and green private use(GAB) at the same time to produce goods to meet the needs of local and non-local green agricultural consumers, then we have an opened green agricultural development model, which can be highlighted as shown below:

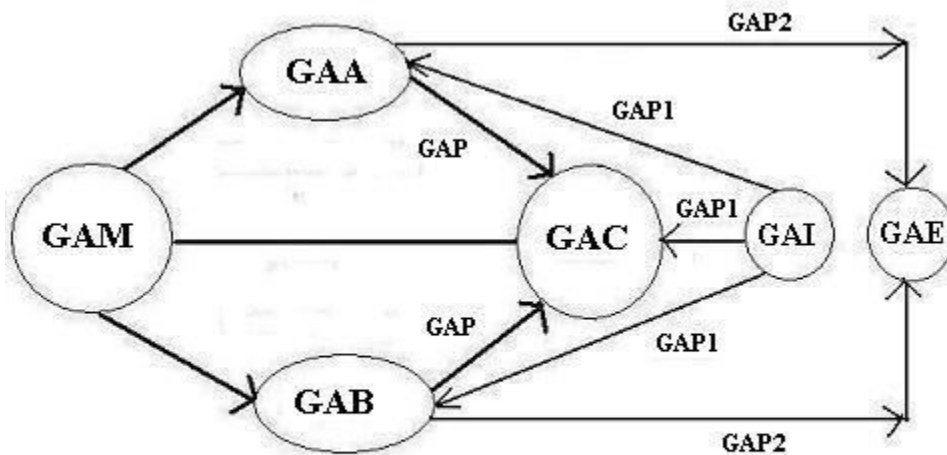


Figure 4 The opened green agricultural development model

Notice that the structure of opened green agricultural model shown in Figure 4 above comes from directly simplifying the structure of the opened general green development model shown in Figure 2 to reflect only green agricultural concerns.

#### i) Export implications

According to Figure 4 above, if the local green agricultural price  $GAP >$  export green agricultural price  $GAP2$ , green agricultural producers should be expected to supply the local green market. If the local green agricultural price  $GAP =$  export green agricultural price  $GAP2$ , green agricultural producers would be indifferent between supplying the local green market or exporting. If the local green agricultural price  $GAP <$  export green agricultural price  $GAP2$ , green producers should be expected to export.

#### ii) Import implications

From Figure 4 above we can say that if the local green agricultural price  $GAP >$  import green agricultural price  $GAP1$ , green agricultural producers should be expected to import green agricultural goods for resale and green agricultural consumers(GAC), especially under globalization, should be expected to import green agricultural goods directly. If the local green agricultural price  $GAP =$  import green agricultural price  $GAP1$ , green agricultural producers would be indifferent between producing or importing green agricultural goods; and green agricultural consumers(GAC) would be indifferent between consuming local green agricultural goods or importing directly. If the local green agricultural price  $GAP <$  import green agricultural price  $GAP1$ , green agricultural producers should be expected not to import, and produce for the

local green market; and green agricultural consumers(GAC) should be expected to consume local green agricultural goods and not import directly.

### **iii) The social externality neutral assumption**

In the opened green agricultural development model in Figure 4 above too there are not social externality concerns as agricultural social margins are assumed not to be needed; and therefore, the green agricultural market price GAP as well as green agricultural imports price GAP1 and green agricultural export price GAP2 are currently assumed to be social externality neutral.

Notice that the green agricultural market price GAP as well as the green agricultural import price GAP1 and the green agricultural export price GAP2 are higher than their corresponding traditional agricultural prices by their respective green margin; and therefore, related green consumption is expected to be lower than corresponding levels of traditional agricultural consumption. Notice too that all these green prices are partial fair trade prices(PFTP) as they do not reflect social margins.

### **iv) Available points of market intervention**

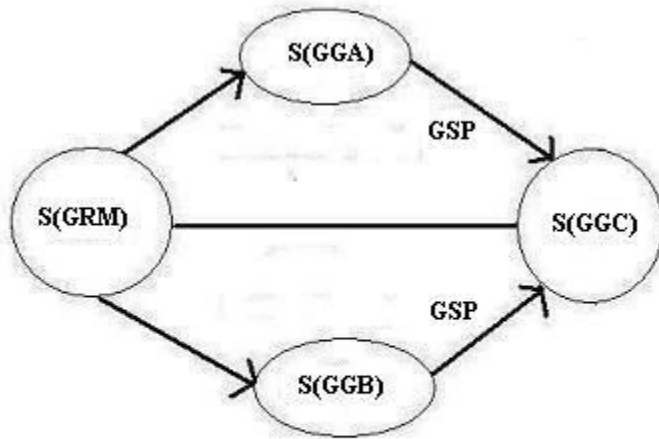
Figure 4 above shows that it is possible to use green agricultural social margins(GASM) to encourage directly or indirectly green public use(GAA) and/or green private use(GAB) producers to be more socially friendly when supplying the local and non-local green agricultural market as current development thinking considers these actions market corrections, just as the internalization of agricultural green margins(AGM) are, not market distortions. Figure 4 also shows that we can also use green agricultural import social margins(GASM1) and green agricultural export social margins(GASM2) to encourage socially friendly green production. Without those green agricultural social margin(GASM), green agricultural import social margins(GASM1) and green agricultural export social margins(GASM2) incentives we should not expect green producers to change behavior towards social friendliness to supply the local and non-local green agricultural market as any increase in their cost of production would lead to a loss in their market share.

In other words, the partial externality neutral assumption makes local and non-local socially friendly fair trade interventions consistent with the opened green agricultural model. Again, notice that adding corresponding social margins to the green agricultural price GAP, to the green import agricultural price GAP1, and to the green export agricultural price GAP2 would lead to higher prices; and therefore, less corresponding consumption is expected under a socially friendly green agricultural development model. Moreover, notice that adding the corresponding social agricultural margin to all those green prices transforms them into full fair trade prices(FFTP).

### **The general closed sustainability model**

If we assume that we can subject the general closed green development model in Figure 1 above to systematic social friendliness, then we can create a general closed sustainability model, where the socially friendly local green resources market[S(GRM)] can be under socially friendly general green public use[S(GGA)} and socially friendly private use[S(GGB)] at the same time to produce goods to meet the needs of only socially friendly local green

consumers[S(GGC)]. The structure of the general closed sustainability model described above can be seen in Figure 5 below:



**Figure 5 The closed general sustainability model**

### **i) Production implications**

Figure 5 above shows that facing the same general sustainability price GSP, both socially friendly green public use[S(GGA)] and socially friendly green private use[S(GGB)] producers would willingly meet the needs of socially friendly local green consumers[S(GGC)]. If facing different prices, then the socially friendly green producer who can supply the general sustainability market at a lower sustainability price will have a bigger share of the market.

### **ii) Consumption implications**

Figure 5 above indicates that at the same general sustainability market price GSP, socially friendly green consumers[S(GGC)] would be indifferent to buying from socially friendly green public use[S(GGA)] or socially friendly green private use[S(GGB)] producers. However, if facing different prices, then socially friendly green consumers[S(GGC)] should be expected to buy from the green supplier with the lowest general sustainability price.

### **iii) The end of externality neutral assumptions**

In the general closed sustainability model in Figure 5 above there are no externality concerns as the general sustainability price(GSP) reflects the extra cost of making green production socially friendly.

See that that the general sustainability market price(GSP) is higher than the general green price(GGP) by the general green social margin(GGSM); and therefore, consumption under sustainability is expected to be lower than the previous levels of general green consumption. Also notice that the general sustainability price GSP is a full fair trade price(FFTP).

### **iv) The role of local green consumer-short to medium term**

During the transition period where the social friendliness of green producers and of consumers is not yet well cemented, green producers, public and/or private, will tend to move towards races to the social bottom to be able to produce green goods at the lowest social cost.

Green consumers facing different sustainability prices for the same good will choose the lowest sustainability price that meets their environmental concerns only. Just as most traditional consumers were not willing to pay more for green goods initially, we should expect that most green consumers may not be willing to pay the full extra cost of social friendliness too. Hence, the transition period from the green market to the sustainability market should be expected to be chaotic due to local races to the social bottom supported by the social friendliness ambivalence of green consumers.

#### **v) The role of local green consumers-long-term**

When the need to be socially friendly is well cemented in the green production and green consumption world, then the true sustainability market can take hold. Here, as green consumers are willing to pay for the full cost of socially friendly green products, then green producers will supply the most socially friendly green products. Producers who do not do that or are unable to do that will lose their green market share as fully socially friendly green consumers would not buy it. With the existence of fully socially friendly green consumers, producers then will have the incentive to produce only socially friendly green products; and we should expect that when we have different sustainability prices for the same product because one is more socially friendly than the other, the more socially friendly product will be cleared by the sustainability market. To continue participating in the sustainability market, green producers will tend to match their level of social friendliness to reflect the same general sustainability price.

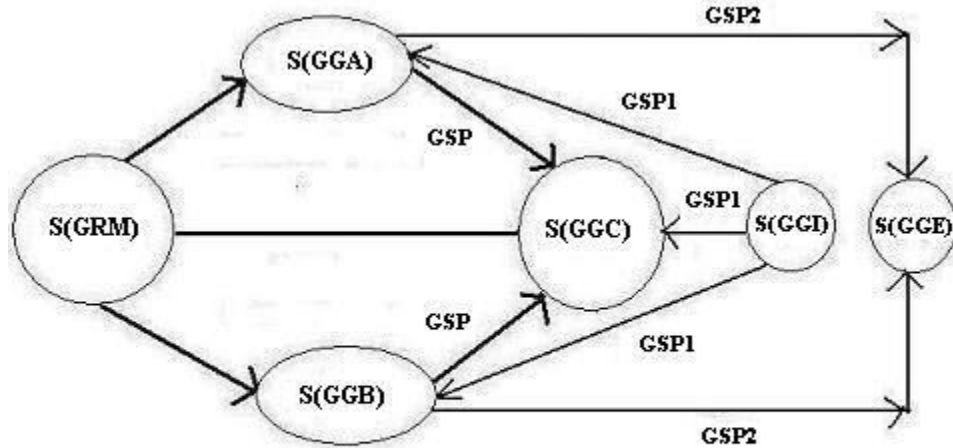
#### **vi) The role of governments and international organizations**

In the short to medium term, governments and international organizations can establish regulation and incentives for green producers to be increasingly more socially friendly; and rewarding them this way with a bigger market share as their social friendliness increases. And governments and international organizations can also establish regulation and incentives for green consumers to be increasingly more socially friendly; and rewarding them this way with more ability to access the sustainability market.

In the long term, governments and international organizations can establish regulation and incentives for green producers to maintain full social friendliness; and rewarding them this way with the market share attracted by full social friendliness. And governments and international organizations can also establish regulation and incentives for green consumers to be able to buy full socially friendly green products; and rewarding them this way with the ability to access the sustainability market.

#### **The general opened sustainability model**

We can extend the closed general sustainability model in Figure 5 above to its opened form as follows: If we assume that the socially friendly local green resources[S(GRM)] can be under socially friendly green public use[S(GGA)] and socially friendly green private use[S(GGB)] at the same time to produce green goods to meet the needs of socially friendly local and non-local green consumers[(S(GGC)), then we have a general opened sustainability model, which can be expressed as shown below:



**Figure 6 The opened general sustainability model**

### **i) Export implications**

Figure 6 above allows us to see that if the local general sustainability price  $GSP >$  general sustainability export price  $GSP2$ , socially friendly green producers should be expected to supply the local socially friendly green market. If the local general sustainability price  $GSP =$  general sustainability export price  $GSP2$ , socially friendly green producers would be indifferent between supplying the local socially friendly green market or exporting. If the local general sustainability price  $GSP <$  general sustainability export price  $GSP2$ , socially friendly green producers should be expected to export.

### **ii) Import implications**

Figure 6 above shows that if the local general sustainability price  $GSP >$  general sustainability import price  $GSP1$ , socially friendly green producers should be expected to import goods for resale and socially friendly consumers, especially under globalization, should be expected to import goods directly. If the local general sustainability price  $GSP =$  sustainability import price  $GSP1$ , socially friendly green producers would be indifferent between producing or importing goods; and socially friendly green consumers would be indifferent between consuming local green goods or importing directly. If the local general sustainability price  $GSP <$  sustainability import price  $GSP1$ , socially friendly green producers should be expected not to import, and produce for the local market; and socially friendly green consumers should be expected to consume local green goods and not import directly.

### **iii) The end of externality neutral assumptions**

In the general opened sustainability model in Figure 6 above there are no externality concerns too as the general sustainability price( $GSP$ ), the general sustainability import price( $GSP1$ ) and the general sustainability export price( $GSP2$ ) reflect the extra cost of making green production socially friendly.

See that that the general sustainability market price( $GSP$ ), the general sustainability import price( $GSP1$ ) and the general sustainability export price( $GSP2$ ) are higher than their corresponding green market prices by the general green social margin( $GGSM$ ), the general green import social margin( $GGSM1$ ), and the general green export social margin( $GGSM2$ ) respectively; and therefore, consumption under sustainability is expected to be lower than the

previous levels of general green consumption. Also notice that the general sustainability price(GSP), the general sustainability import price(GSP1) and the general sustainability export price(GSP2) are all full fair trade prices(FFTP).

**iv) The role of local and non-local green consumer-short to medium term**

During the transition period where the social friendliness of local and non-local green producers and of consumers is not yet well cemented, socially friendly green producers, public and/or private, will tend to move towards races to the social bottom to be able to produce green goods at the lowest social cost possible. Local and non-local green consumers facing different sustainability prices for the same good will choose the lowest sustainability price that meets their environmental concerns only. Just as most local and non-local traditional consumers were not willing to pay more for green goods initially, we should expect that most local and non-local green consumers may not be willing to pay the full extra cost of social friendliness too. Hence, the transition period from the green market to the sustainability market should be expected to be chaotic due to local and non-local races to the social bottom supported by the social friendliness ambivalence of local and non-local green consumers.

**v) The role of local and non-local green consumers-long-term**

When the need to be socially friendly is well cemented in the local and non-local green production and green consumption world, then the true sustainability market can take hold. Here, as local and non-local green consumers are willing to pay for the full cost of socially friendly green products, then local and non-local green producers will supply the most socially friendly green products. Local and non-local green producers who do not do that or are unable to do that will lose their sustainability market share as local and non-local green consumers would not buy their products. With the existence of local and non-local fully socially friendly green consumers, green producers then will have the incentive to produce only socially friendly green products; and we should expect that when we have different sustainability prices for the same local and non-local green product because one is more socially friendly than the other, the more socially friendly product will be cleared by the sustainability market. To continue participating in the sustainability market, local and non-local green producers will tend to match their level of social friendliness to reflect the same sustainability price locally and non-locally.

**vi) The role of governments and international organizations**

In the short to medium term, governments and international organizations can establish regulation and incentives for local and non-local green producers to be increasingly more socially friendly; and rewarding them this way with a bigger market share as their social friendliness increases. And governments and international organizations can also establish regulation and incentives for local and non-local green consumers to be increasingly more socially friendly; and rewarding them this way with more ability to access the sustainability market.

In the long term, governments and international organizations can establish regulation and incentives for local and non-local green producers to maintain full social friendliness; and rewarding them this way with the market share attracted by full social friendliness. And governments and international organizations can also establish regulation and incentives for local and non-local green consumers to be able to buy full socially friendly green products; and rewarding them this way with the ability to access the sustainability market.

### The closed agricultural sustainability model

If we assume that we can subject the general closed green agricultural development model in Figure 3 above to systematic social friendliness, then we can create a general closed agricultural sustainability model, where the socially friendly local green agricultural resources market[S(GAM)] can be under socially friendly general green agricultural public use[S(GAA)] and socially friendly private green agricultural use[S(GAB)] at the same time to produce green agricultural goods to meet the needs of only socially friendly local green agricultural consumers[S(GAC)]. The structure of the closed agricultural sustainability model described above can be seen in Figure 7 below:

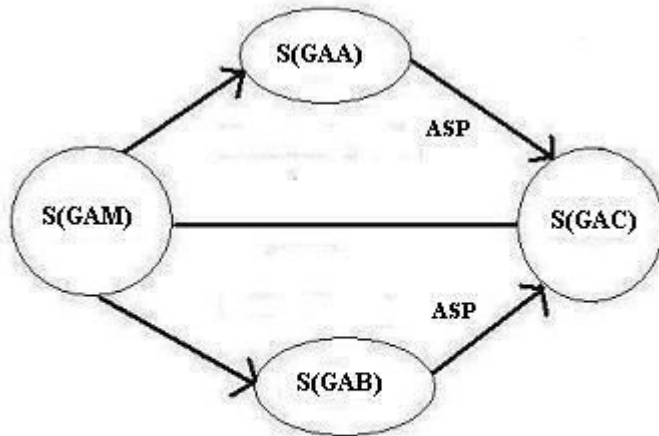


Figure 7 The closed agricultural sustainability model

Notice that the structure of the closed agricultural sustainability model shown in Figure 7 above comes from directly simplifying the structure of the general closed sustainability model shown in Figure 5 to reflect only socially friendly green agricultural issues.

#### i) Production implications

Figure 7 above shows that facing the same agricultural sustainability price ASP, both socially friendly green public agricultural use[S(GAA)] and socially friendly green private agricultural use[S(GAB)] producers would willingly meet the needs of socially friendly local green agricultural consumers[S(GAC)]. If facing different prices, then the socially friendly

green agricultural producer who can supply the agricultural sustainability market at a lower agricultural sustainability price will have a bigger share of the market.

## **ii) Consumption implications**

Figure 7 above indicates that at the same agricultural sustainability market price ASP, socially friendly green agricultural consumers[S(GAC)] would be indifferent to buying from socially friendly green public agricultural use[S(GAA)] or socially friendly green private agricultural use[S(GAB)] producers. However, if facing different prices, then socially friendly green agricultural consumers[S(GAC)] should be expected to buy from the supplier with the lowest agricultural sustainability price.

## **iii) The end of externality neutral assumptions**

In the closed agricultural sustainability model in Figure 7 above there are no externality concerns as the agricultural sustainability price(ASP) reflects the extra cost of making green agricultural production socially friendly.

See that that the agricultural sustainability market price(ASP) is higher than the green agricultural price(GAP) by the green agricultural social margin(GASM); and therefore, consumption under agricultural sustainability is expected to be lower than the previous levels of green agricultural consumption. Also notice that the agricultural sustainability price ASP is a full fair trade price(FFTP) as it reflects social margins too.

## **iv) The role of local green agricultural consumer-short to medium term**

During the transition period where the social friendliness of green agricultural producers and of green agricultural consumers is not yet well cemented, green agricultural producers, public and/or private, will tend to move towards races to the social bottom to be able to produce green agricultural goods at the lowest social cost possible. Green agricultural consumers facing different agricultural sustainability prices for the same good will choose the lowest agricultural sustainability price that meets their agricultural environmental concerns only. Just as most traditional agricultural consumers were not willing to pay more for green agricultural goods initially, we should expect that most green agricultural consumers may not be willing to pay the full extra cost of social friendliness too. Hence, the transition period from the green agricultural market to the agricultural sustainability market should be expected to be chaotic due to local races to the social bottom supported by the social friendliness ambivalence of green agricultural consumers.

## **v) The role of local green agricultural consumers-long-term**

When the need to be socially friendly is well cemented in the local green agricultural production and green agricultural consumption world, then the true agricultural sustainability market can take hold. Here, as fully socially friendly green agricultural consumers are willing to pay for the full cost of socially friendly green agricultural products, then green agricultural producers will supply the most socially friendly green agricultural products possible. Green agricultural producers who do not do that or are unable to do that will lose their green agricultural market share as green agricultural consumers would not buy them. With the existence of fully socially friendly green agricultural consumers, green agricultural producers then will have the incentive to produce only socially friendly green agricultural products; and we should expect that when we have different agricultural sustainability prices for the same green

agricultural product because one is more socially friendly than the other, the more socially friendly product will be cleared by the agricultural sustainability market. To continue participating in the agricultural sustainability market, green agricultural producers will tend to match their level of social friendliness to reflect the same agricultural sustainability price.

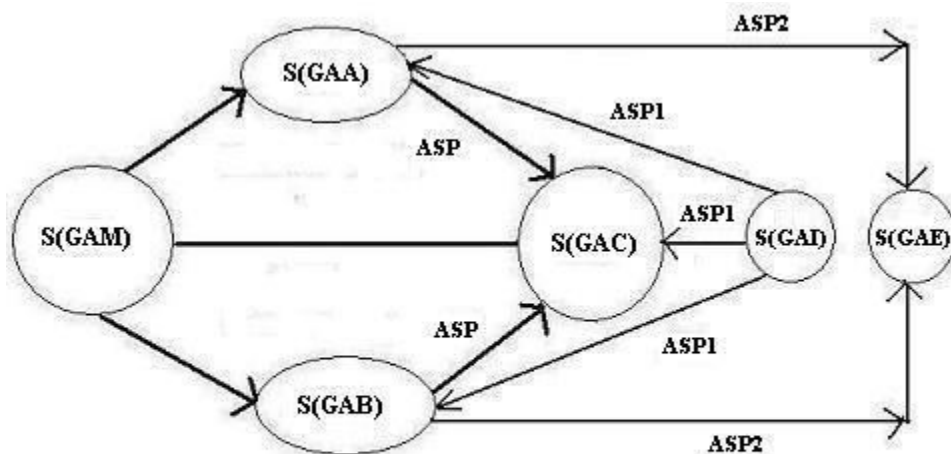
**vi) The role of governments and international organizations**

In the short to medium term, governments and international organizations can establish regulation and incentives for green agricultural producers to be increasingly more socially friendly; and rewarding them this way with a bigger market share as their social friendliness increases. And governments and international organizations can also establish regulation and incentives for green agricultural consumers to be increasingly more socially friendly; and rewarding them this way with more ability to access the agricultural sustainability market.

In the long term, governments and international organizations can establish regulation and incentives for green agricultural producers to maintain full social friendliness; and rewarding them this way with the market share attracted by full social friendliness. And governments and international organizations can also establish regulation and incentives for green agricultural consumers to be able to buy full socially friendly green agricultural products; and rewarding them this way with the ability to access the agricultural sustainability market.

**The opened agricultural sustainability model**

We can extend the closed agricultural sustainability model in Figure 7 above to its opened form as follows: If we assume that the socially friendly local green agricultural resources[S(GAM)] can be under socially friendly green public agricultural use[S(GAA)] and socially friendly green private agricultural use[S(GAB)] at the same time to produce green agricultural goods to meet the needs of socially friendly local and non-local green agricultural consumers[S(GAC), then we have an opened agricultural sustainability model, which can be expressed as shown below:



**Figure 8 The opened agricultural sustainability model**

Notice that the structure of opened agricultural sustainability model shown in Figure 8 above comes from directly simplifying the structure of the opened general sustainability model shown in Figure 6 to reflect only socially friendly green agricultural concerns.

### **i) Export implications**

Figure 8 above allows us to see that if the local agricultural sustainability price  $ASP >$  agricultural sustainability export price  $ASP2$ , socially friendly green agricultural producers should be expected to supply the local socially friendly green agricultural market. If the local agricultural sustainability price  $ASP =$  agricultural sustainability export price  $ASP2$ , socially friendly green agricultural producers would be indifferent between supplying the local socially friendly green agricultural market or exporting. If the local agricultural sustainability price  $ASP <$  agricultural sustainability export price  $ASP2$ , socially friendly green agricultural producers should be expected to export.

### **ii) Import implications**

Figure 8 above shows that if the local agricultural sustainability price  $ASP >$  agricultural sustainability import price  $ASP1$ , socially friendly green agricultural producers should be expected to import goods for resale and socially friendly green agricultural consumers, especially under globalization, should be expected to import green agricultural goods directly. If the local agricultural sustainability price  $ASP =$  agricultural sustainability import price  $ASP1$ , socially friendly green agricultural producers would be indifferent between producing or importing green goods; and socially friendly green agricultural consumers would be indifferent between consuming local green goods or importing directly. If the local agricultural sustainability price  $ASP <$  agricultural sustainability import price  $ASP1$ , socially friendly green agricultural producers should be expected not to import, and produce for the local green agricultural market; and socially friendly green agricultural consumers should be expected to consume local green agricultural goods and not import directly.

### **iii) The end of externality neutral assumptions**

In the opened agricultural sustainability model in Figure 8 above there are no externality concerns too as the agricultural sustainability price( $ASP$ ), the agricultural sustainability import price( $ASP1$ ) and the agricultural sustainability export price( $ASP2$ ) reflect the extra cost of making green agricultural production socially friendly.

See that that the agricultural sustainability market price( $ASP$ ), the agricultural sustainability import price( $ASP1$ ) and the agricultural sustainability export price( $ASP2$ ) are higher than their corresponding green agricultural market prices by the green agricultural social margin( $GASM$ ), the green agricultural import social margin( $GASM1$ ), and the green agricultural export social margin( $GASM2$ ) respectively; and therefore, consumption under agricultural sustainability is expected to be lower than the previous levels of green agricultural consumption. Also notice that the agricultural sustainability price( $ASP$ ), the agricultural sustainability import price( $ASP1$ ) and the agricultural sustainability export price( $ASP2$ ) are all full fair trade prices( $FFTP$ ) as they all reflect social margins too.

### **iv) The role of local and non-local green agricultural consumer-short to medium term**

During the transition period where the social friendliness of local and non-local green agricultural producers and of green agricultural consumers is not yet well cemented, socially

friendly green agricultural producers, public and/or private, will tend to move towards races to the social bottom to be able to produce green agricultural goods at the lowest social cost possible. Local and non-local green agricultural consumers facing different agricultural sustainability prices for the same good will choose the lowest agricultural sustainability price that meets their agricultural environmental concerns only. Just as most local and non-local traditional consumers were not willing to pay more for green goods initially, we should expect that most local and non-local green agricultural consumers may not be willing to pay the full extra cost of social friendliness too. Hence, the transition period from the green agricultural market to the agricultural sustainability market should be expected to be chaotic due to local and non-local races to the social bottom supported by the social friendliness ambivalence of local and non-local green agricultural consumers.

**v) The role of local and non-local green agricultural consumers-long-term**

When the need to be socially friendly is well cemented in the local and non-local green agricultural production and green agricultural consumption world, then the true agricultural sustainability market can take hold. Here, fully socially friendly as local and non-local green agricultural consumers are willing to pay for the full cost of socially friendly green agricultural products, then local and non-local green agricultural producers will supply the most socially friendly green agricultural products. Local and non-local green agricultural producers who do not do that or are unable to do that will lose their agricultural sustainability market share as local and non-local green agricultural consumers would not buy their green agricultural products. With the existence of local and non-local fully socially friendly green agricultural consumers, green agricultural producers then will have the incentive to produce only socially friendly green agricultural products; and we should expect that when we have different agricultural sustainability prices for the same local and non-local green agricultural product because one is more socially friendly than the other, the more socially friendly green agricultural product will be cleared by the agricultural sustainability market. To continue participating in the agricultural sustainability market, local and non-local green agricultural producers will tend to match their level of social friendliness to reflect the same agricultural sustainability price locally and non-locally.

**vi) The role of governments and international organizations**

In the short to medium term, governments and international organizations can establish regulation and incentives for local and non-local green agricultural producers to be increasingly more socially friendly; and rewarding them this way with a bigger market share as their social friendliness increases. And governments and international organizations can also establish regulation and incentives for local and non-local green agricultural consumers to be increasingly more socially friendly; and rewarding them this way with more ability to access the agricultural sustainability market.

In the long term, governments and international organizations can establish regulation and incentives for local and non-local green agricultural producers to maintain full social friendliness; and rewarding them this way with the market share attracted by full social friendliness. And governments and international organizations can also establish regulation and incentives for local and non-local green agricultural consumers to be able to buy full socially friendly green agricultural products; and rewarding them this way with the ability to access the agricultural sustainability market.

## **Conclusions**

First, it was indicated that the closed and opened general green and green agricultural development models have the same structure as the closed and opened traditional general development and traditional agricultural models, but they are corrected to reflect green margins internalizing that way general and agricultural environmental concerns. Second, it was stressed that consumption levels under the general green model and green agricultural models should be expected to be lower than those under the traditional general development and traditional agricultural models, both when closed or opened, as general green and green agricultural prices are higher than traditional prices. Initially, traditional general and agricultural consumers are expected not to be willing to pay the full extra cost of greening general and agricultural production, but in the long term they are expected to do it cementing that way strong green markets.

Third, it was pointed out that the closed and opened general sustainability and agricultural sustainability models have the same structure as the closed and opened general green development and green agricultural models, but they are corrected to reflect social margins too internalizing that way general and agricultural social concern. Fourth, it was highlighted that consumption levels under the general sustainability and agricultural sustainability models should be expected to be lower than those under the general green and green agricultural models, both when closed or opened, as general sustainability and agricultural sustainability prices are higher than green prices. Initially, green general and green agricultural consumers are expected not to be willing to pay the full extra cost of making green general and green agricultural production fully socially friendly, but in the long term they are expected to do it cementing that way strong sustainability markets.

And finally, it was indicated that we should expect the transition from green markets to sustainability markets to be chaotic as we should expect social races to the bottom initially as green producers taking advantage of the socially friendly ambivalence of green consumers to bear the full cost of social friendliness will tend to produce green goods at the lowest social cost possible. And when green consumers are willing to bear the full cost of social friendliness, green producers will produce only socially friendly green products.

## **References**

European Communities(EC), 2008. *The economics of ecosystems and biodiversity: An Interim Report*, Brussels Belgium.

Food and Agriculture Organizations(FAO), 2009. *Low Greenhouse Gas Agriculture: Mitigation and adaptation potential of sustainable farming systems*, Rome, Italy.

Food and Agriculture Organizations(FAO), 2010. *'Climate-Smart' Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation*, The Hague Conference on Agriculture. Food Security and Climate Change, Rome, Italy.

**International Labour Office(ILO), 2010.** *Message by Juan Somavia Director-General of the International Labour Office on the occasion of World Environment Day, June 05, Genève, Switzerland.*

Muñoz, Lucio, 2000. **An Overview of Some of the Policy Implications of the Eco-Economic Development Market,** *Environmental Management and Health*, Prof. Walter Leal Filho / PhD(ed), Vol. 11, No. 2, Pp. 157-174, MCB University Press, UK.

Muñoz, Lucio, 2003. **Eco-Economic Development Under Social Constraints: How to Redirect it Towards Sustainability?**, In: *THEOMAI*, Issue # 8, October, Argentina

Muñoz, Lucio, 2010a. **The Past Versus the Present in Development Thinking: Pointing Out the Structure of the Old Agricultural Development Model After Internalizing Environmental Externalities,** *Journal of Sustainability*, Issue 3, Number 2, September 26, Rio Rancho, New Mexico USA.

Muñoz, Lucio, 2010b. **What If Markets Have Always Been Distorted? Would It Then Be a Good Fix to Add Fair Trade Margins to Correct Distorted Agricultural Market Prices?**, *Journal of Sustainability*, Issue 2, Number 4, June 12, Rio Rancho, New Mexico, USA.

Organization for Economic Co-operation and Development(OECD), 2009. **Declaration on Green Growth Adopted at the Meeting of the Council at Ministerial Level on 25 June**, Paris, France.

Organization for Economic Co-operation and Development(OECD), 2010. **Transition to a low-carbon economy: Public Goals and Corporate Practices**, 10th OECD Roundtable on Corporate Responsibility, 30 June – 1 July 2010, OECD Conference Centre, Paris, France

United Nations(UN), 2010. **The Millennium Development Goals**, New York, New York, USA.

World Bank(WB), 2009a. **Low-Carbon Development for Mexico**, World Bank, Washington, D.C., USA.

World Bank(WB), 2009(b). **10 Years of Experience in Carbon Finance**, Washington, D.C., USA.

World Bank(WB), 2010. **New Multi-Million Dollar Fund For Developing Country Carbon Trading Initiatives**, **Press Release, December 08**, Washington, D.C., USA.

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