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Introducing a Simple Qualitative Comparative Dichotomy Approach to State and Clarify Sustainable Development and Sustainability Related Concepts and Issues

By

Lucio Muñoz*

***Independent Qualitative Comparative Researcher/Consultant, Vancouver, BC, Canada. E-mail: munoz@interchange.ubc.ca**

Abstract

The planning, monitoring, and evaluation of local/ regional development projects and programs has become more difficult as the result of several sources of confusion related to the dynamic interaction of different development paradigms and their sometimes contradictory objectives. Unclear development related concepts also complicate efforts directed at comparing and classifying those local/regional projects and programs. One way of clarifying the confusing issues raised above may be by addressing the following questions: Which are the different faces of development? Which are the different personalities of development?; Is sustainable development unique?; Is sustainable development optimal development?; Is sustainability sustainable development or Is sustainable development sustainability; and Is sustainability consistent with the concept of strong sustainability? The simple qualitative comparative analytical tool presented in this paper is described in such a way as to provide an answer to the above mentioned questions from a system analysis point of view.

Introduction

The planning, monitoring, and evaluation of local/regional development projects and programs becomes more difficult as the result of several sources of confusion related to the dynamic interaction of different development paradigms and their sometimes contradictory objectives.

Some of the situations created by this confusion are: a) It is possible to develop sets of indicators/assumptions, which are consistent with a particular sustainable development paradigm, but not with sustainability. This raises issues related to the comparability of different local projects and programs as they may reflect different paradigms; b) It makes it more difficult to develop local indicators/assumptions consistent with regional conditions as the local sustainable development model may be different than the regional model. This brings out issues related to the integration and the holistic handling of local-regional problems; and c) It makes the inclusion

of equity and social justice issues in these indicators/assumptions less transparent. This indicates issues related to the fairness of local/global programs.

Pinfield(1996) indicates that the sustainability indicators developed by the Department of the Environment in the UK came out to be mainly an environmental set. Jones(1996) suggests that the disagreements on what sustainable development means actually complicate the implementation of this concept and the promotion of sustainability at the local level. Hence, unclear concepts may affect the operability of development strategies, regardless of paradigms, including the well-accepted strategy of thinking globally acting locally. Agyeman and Evans(1996) regard the above strategy as one of the most important original strategies of the international ecological movement.

They also affect the effectiveness of strategies based on the confusing concept of sustainable development such as Agenda 21. Upton(2002) points out that the main limitation of Agenda 21 is that it means different things to different people. Besides this, it was pointed out in 2003 that Agenda 21 indicators and methodologies were put together and implemented to deal with sustainability issues in the absence of sustainability theory; and one possible theoretical and practical way to correct that situation was suggested(Muñoz 2003). Therefore, clear concepts are needed to induce clear action, transparency, and to facilitate the monitoring of activities at all levels, from personal to global. Below, some concepts are revised briefly in order to establish or identify some of the sources of the above mentioned confusion.

i) What is development?

Development is defined as “a gradual advance or growth through progressive changes” and to develop is defined as “to expand by a process of growth”(Gove 1965). Therefore, development can be seen as the process by which existing economic, social, and environmental capital or any combination of them can be used in such a manner to achieve progress gradually; for example, the use of social capital to achieve social progress or the use of social capital and environmental capital to achieve economic progress.

Hence, development can take the form of social development, environmental development or economic development or of any combination of them. In other words, development can take place even in the absence of some types of development. However, the concept development is in practice usually used in the context of meaning exclusively economic development, which is the traditional paradigm. Desai(1998) points out that this traditional model of economic growth does not considers ecological values to be important to economics or economic development. Under this traditional view, social and environmental resources are at the disposal of economic forces for sustaining and supporting the production of goods and services for the market place. In summary, development has many meanings, which is the first source of confusion.

ii) What is sustainable development?

WCED(1987) defines sustainable development as "development that meets the needs of

the present generations without compromising the ability of future generations to meet their own needs". The problem with this definition is that all types of development can be considered sustainable if they meet the development needs of the present generation without compromising the ability of future generations to meet their own development needs. Under this view, economic development, social development, environmental development or any combination of them could be sustainable development. For example, development that meets the environmental development needs of the present generation without compromising the ability of future generations to meet their own environmental development needs is sustainable according to the definition, and it is, therefore, sustainable environmental development.

A definition of sustainable social development or sustainable economic development can be derived in a similar fashion. Hence, sustainable development can take different forms depending on the type of development paradigm it represents. And its ability to take different forms or meanings appears to be the factor responsible for the wide acceptance of the World Commission on Sustainable Development's concept. Adams(2001) indicates that the sustainable development paradigm became quickly accepted and popular because it permitted the fitting of different development ideas or adjustments. However, the concept of sustainable development is more often used in practice in a context meaning sustainable economic development or environmentally friendly economic development, which is the dominant paradigm today. This is the result of adjusting the traditional economic development paradigm mentioned above to reflect today's environmental concerns or eco-economic view of development.

Hence, from this view, sustainable development relates to the idea of maximising economic growth subject to ecological constraints or of finding win-win situations. The above indicates that the expression sustainable development actually means sustained economic development. In short, the concept of sustainable development has several meaning depending on the person or group presenting the argument, which is the second source of confusion.

iii) What is sustainability?

The concept of sustainability came as a way of clarifying the confusing nature of the term "sustainable economic development" as academics started arguing in stronger terms that the traditional economic development model did not account for environmental and social externalities, and hence, it was not sustainable. In the case of developing countries, Desai(1998) describes the different ecological concerns challenging the traditional view of economic development.

Given the different concerns left out, sustainable development is not equal to optimal development because it refers to a sustained state, not a balanced state. Sedjo et al(1998) indicates that there is a general understanding that sustainability refers to balancing ecological, social, and economic concerns in such a way so as to accommodate those same concerns in the future. Hence, sustainability refers to the notion that development should account for all economic, social, and environmental concerns at the same time now and in the future. This notion of development implies that sustainability reflects the optimal process of development.

However, commonly in theory and in practice sustainability is used in a context meaning sustainable development. For example, Pinfield(1996) theoretically defines sustainable development as the interception of three aspects: community development, ecological development, and economic development. Lopez(1995) indicates that sustainable development strategies are processes that are cyclical and participative; that are based on planning-action approaches; and which are aimed at improving the quality of life through maintaining a balance between the economic, social, and environmental goals of development. Other academics used those concepts as equivalent. For example, Williams(1996) uses the term sustainable development and sustainability when describing the guiding principles of the local agenda 21 process apparently as if they mean the same. Sedjo et al(1998) considers the definition of sustainable development as put forward by the Bruntland Commission as one that best represents the modern concept of sustainability. For others, sustainable development deals with the integration of social, economic, and environmental objectives in the present in ways that it does not compromise future needs(OECD 2001), which is practically a sustainability concept. Definitions and uses like those above make the concept of sustainable development equivalent to the concept of sustainability, and these types of situations are the third source of confusion.

iv) What is weak and strong sustainability?

Two well-known and accepted concepts related to sustainable development are weak sustainability and strong sustainability. Weak sustainability refers to the notion that we have the responsibility of passing to future generations an equal amount or higher of the capital stock we have now regardless of the form. Strong sustainability refers to notion that the different components of the capital stock(man-made, human, and natural) are not substitutes of each other so that an equal amount or higher of each of them must be transferred to future generations.

To ease the extremes positions of the above two terms, Pearce(1993) breaks sustainability into four concepts: very weak sustainability, which allows for extensive substitution; weak sustainability, some substitution of non-critical natural capital allowed; strong sustainability, no substitution, system approached, and zero economic and population growth; and very strong sustainability, no substitution, reduction of economic and population growth.

WB(1998) also provides the following four types of sustainability: weak sustainability, which refers to maintaining total capital per capita intact or increasing without regard to its composition and different types of capital are treated as substitutes; sensible sustainability, which refers to the existence of substitutability too between the different types of capital, but it also recognises they are also complementary and there are some concerns about the final composition of the capital stock; strong sustainability, which requires maintaining each type of capital intact separately, but allows for some substitutability within each type of capital; and absurdly strong sustainability, which allows for zero depletion of non-renewable and renewable resources, and only allows for the harvesting of the over mature portion of the renewable stock. McLaren(1996) calls the weak version of sustainable development where ecological capacity can be traded off against growth or development "false sustainability" and he calls the strong version of sustainable

development where ecological capacity can not be traded off "true sustainability".

Apparently, all the above concepts are based on quantitative value measurements of the capital stock to be transferred to the next generations, but we should keep in mind that it may be possible to leave a better quality economy, a better quality environment, and a better quality society even if the size of man-made capital, human capital, and natural capital decreases if the increase in its qualitative value more than compensate the quantitative decrease. The better the quality of the stock of capital we leave, the higher the socio-eco-economic benefits that future generations will receive. As constraints to quantitative growth become more and more binding, qualitative growth will become an attractive venue. Goodland(1997) indicates that the transition from quantitative growth to qualitative growth is already under way. While the above concepts are widely used and cited, it is not clear how they specifically relate to the concept of sustainable development or to the concept of sustainability or to both, which is the fourth source of confusion.

The need to clarify the above sources of confusion

Some people may benefit by the use of unclear concepts, which may explain the apparent resistance to state clearly as the goal of development "sustainability", instead of sustainable development. As the sustainability debate is now basically about shaping its deep meaning(Brown 2002) or structure, then ways to differentiate it from other forms of development are desirable. The need to ensure theory-practice consistency when dealing with sustainable development and sustainability issues has been recently stressed(Muñoz 2009). Hence, there is a need to develop frameworks that could be helpful to aid in the dissipation of this conceptual confusion; and that can uncover clearly the different types of development process possible, and their main characteristics and assumptions. This way, planning, monitoring, and evaluation programs can be more efficiently designed and carried out. Moreover, clear concepts allow for clear comparability and classification of development programs actually being implemented at the local and regional level. The author believes that one way of clarifying the development issues raised above may be by addressing the following questions: Which are the different faces or types of development? Which are the different personalities of development?; Is sustainable development unique?; Is sustainable development optimal development?; Is sustainability sustainable development or Is sustainable development sustainability; and Is sustainability consistent with the concept of strong sustainability? The simple qualitative comparative analytical tool presented in this paper is described in such a way so as to provide an answer to the above mentioned questions from a system analysis point of view.

Several academics have addressed some of the questions mentioned above, not from the three system model points of view, but from the sustainable development point of view(see Pierce 1993; WB 1998). The practical and theoretical difficulties of developing sustainability models have been recognised since about 1987 when the inclusion of environmental and social concerns on developments models became binding. O'Riordan(1988) in his article "The Politics of Sustainability" summarises most of the scepticism about modelling sustainability and its actual

implementation. However, the search for ways to break this theoretical/practical modelling block continues, and below there is a detailed description of one more of such honest attempts.

Objectives

This paper has the following objectives: a) To introduce a simple qualitative comparative dichotomy approach that can be used to state all possible types of development; and b) To use this framework to provide ideas that may help clarify concepts such as development, optimal development, sustained development, sustainable development and sustainability by pointing out their different paradigm structures and differences.

Methodology

First, the qualitative comparative terminology used in this paper is listed. Second, some operational concepts and rules relevant to the ideas presented here are discussed. Third, The ABC development model based on qualitative comparative dichotomies is introduced and used to highlight a) the structure of development when there are no components in active form and when all of them are in active form; b) the structure of the deferent faces and personalities of development; c) the structure of the different faces of sustainable development; and d) the structure of the unique face of sustainability. And finally, some relevant conclusions are provided.

Terminology

The qualitative comparative dichotomy terminology used in this paper is listed below. Notice that this terminology is consistent with terminology commonly used by Qualitative Comparative Researchers(See Ragin 1987, 1994; Rudel and Roper 1996; Muñoz 2003, 2009). In this paper, if a characteristic is said to be dominant, then it has an active role in system dynamics, and it is represented by a capital letter. On the other hand, if a characteristic is said to be dominated, then it has a passive role in system dynamics, and it is represented by a lower case letter.

A = Indicates that society plays an active role

a = Indicates that society plays a passive role

B = Indicates that the economy plays an active role

D = Development

SD = Sustainable development

S = Sustainability

b = Indicates that the economy plays a passive role RD = Regional development

C = Indicates that the environment plays an active role Di = Development in community "i"

c = Indicates that the environment plays a passive role Dj = Development in community "j"

d = Anti-thesis development model D* = Optimal development

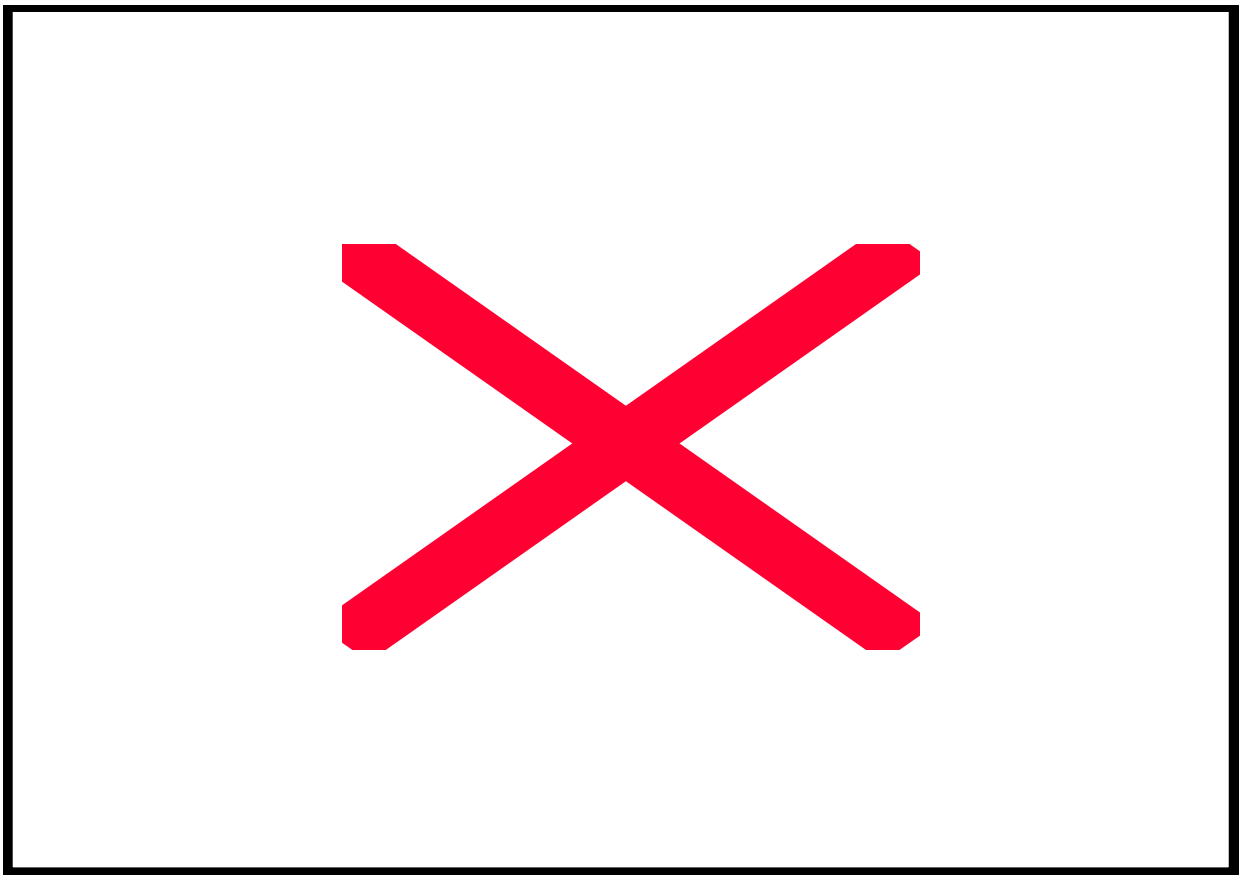
SDk = Sustainable development type "k" Dk = Development type "k"

Operational concepts

To facilitate the presentation of the methodology used to derive the answers to the above questions, the different concepts and ideas used in this paper are described in detail below.

i) Defining development, sustainable development, and sustainability

Development(D) is a holistic and systematic process resulting from the dynamic interaction of three components: the society(A), the economy(B), and the environment (C). Figure 1 below describes development(D) as a system driven by changes in social(human), economic(market), and environmental (ecological) values, qualitative or/and quantitative values.



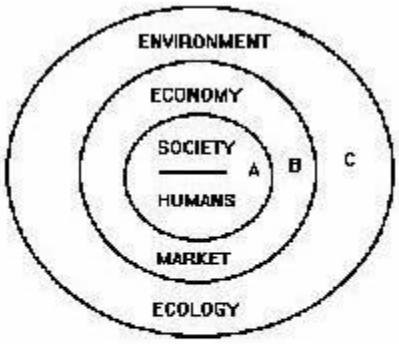


Figure 1 The System Development: It indicates that development is the by product of social, economic, and environmental interactions. In other words, development is driven by the dynamic interaction of humans, markets, and ecology.

Figure 1 also indicates the following: society is at the center of the system; the economy separates society from the environment; and the environment supports both the economy and society. Among a few of the implications of the systematic structure of development(D) in Figure 1 are the following: if humans were to disappear from the face of the earth, there would be no economy, and the environment would possible recover through natural processes; if there is no

formal economy, then society would interact with the environment directly; if the environment were to be completely degraded, polluted, and exhausted both the formal economy and society would collapsed; and both society and the economy have an environmental footprint, and therefore, a maximum and an optimal scale.

It can be seen that under this view of dominant/active role vrs dominated/passive role , development(D) takes place when at least one of the three components of the system shown in Figure 1, society, economy, and environment, has or plays an active role. If all components of the system in Figure 1 have a passive role, then there is no development(d). Sustainable development(SD), on the other hand, takes place when at least one of the three elements of the system indicated in Figure 1, society, economy, and environment, has or plays a passive role or is used to sustain the system. Sustainability(S) takes place when all the three components of the system pointed out in Figure 1 have or are playing an active role at the same time. Weak sustainability is found when there is system-system dominance while strong sustainability is found when there is not system-system dominance. One example would be having society(A) and the economy(B) in Figure 1 in dominant/active form; and the environment(c) in passive form, this is weak sustainability as there is system-system dominance. And therefore, true sustainability is strong sustainability as under true sustainability, there is no system-system dominance. In the case, society(A), economy(B), and environment(C) in Figure 1 are in dominant/active form we have true sustainability, then there is no system-system dominance; and therefore there is strong sustainability;

ii) Combination of forces within development models

The combination of individual forces allows for expressing situations of conjunctural causality, which are underlying development processes(D). For example, considering the following model:

D = Abc ;

The above model indicates that in this type of development, social forces(A) are paramount while economic forces(b) and environmental forces(c) have a passive role. It assumes that changes in the economy and in the environment have no impact on society; and that society has the economy and the environment at its disposition to achieve social goals and needs. And hence, this is the sustained social development model-(Capital letters indicate an active role and lower case letters indicate a passive role).

iii) Comparing sets of forces between development models

By comparing the combination of forces underlying the development processes of different areas or localities, we can gain an insight into their similarities and differences. For example, considering the two following models:

Di = Abc; where Di = development conditions in locality "i"

Dj = aBc; where Dj = development conditions in locality "j"

The above models indicate that the development conditions in locality Di are different from those of locality Dj: in locality Di, societal forces(A) are dominant and in locality Dj, economic forces(B) are the active ones. In other words, locality Di follows socialist goals and locality Dj follows capitalist goals. However, the two localities are similar in that in both of them the environment(c) is assumed to have a passive role, and must accommodate to either societal or economic goals. Hence, similarities and differences can be helpful into providing insight into patterns of active or passive dominant roles across localities and areas. For example, if regional development(RD) were made up of development conditions in those two localities, the following holds:

RD = Di + Dj = Abc + aBc = c(Ab + aB).

The above regional development(RD) model indicates that the environment(c) is the common passive factor at the regional level. Hence, the implementation of environmental policies could be a common policy in both localities. And perhaps this common policy could be implemented without much discourse if social and economic goals in this region can be balanced out successfully. For example, if there are win-win situations in social and economic terms, locality Di and locality Dj should be expected to see an incentive and take action in implementing a common environmental policy like global warming or a ban on pesticides.

The ABC development model based on qualitative dichotomies

i) The ABC development model

D = A + B + C

The above model simply says that there is development(D) when social factors(A) or economic factors(B) or environmental factors(C) or any combinations of them are present as active forces. One implication of this development model is that each set of forces are sufficient for development to take place, but not necessary. For example, if the economy(B) has the dominant role, development(D) will take place whether or not social factors(A) or environmental factors(C) are active or not.

ii) The ABC anti-thesis development model

d = abc

The above anti-thesis development model indicates that there is no development(d) when all three factors are absent or passive at the same time.

iii) The ABC optimal development model

*

D = ABC

The above expression indicates that development is optimal when all three types of forces are present and have an active role at the same time. The main implication of this expression is that the active presence of these three factors at the same time is a sufficient and a necessary condition for optimal development to take place. In other words, if one or two of these three factors is passive, development can not be optimal.

iv) The different faces of development(D)

The formula to find the different faces or types of development using dichotomy rules is the following:

$$D = 2^{n} - 1$$

; Where 2 means two choices, active and passive
n = number of forces or factors
1 = the anti-thesis development model

A direct application of the above formula to the ABC development model leads to the following:

$$D = 2^{3} - 1 = 8 - 1 = 7 \text{ faces}$$

The above means that 7 different types of development models or of faces of development are possible, which are described below:

D1 = Abc = Social factors(A) are active only

D2 = aBc = Economic factors(B) are active only

D3 = abC = Environmental factors(C) are active only

D4 = ABc = Socio-Economic factors are active only

D5 = AbC = Socio-Environmental factors are active only

D6 = aBC = Economic-Environmental factors are active only

D7 = ABC = All three factors are active at the same time

v) The different personalities of development

Based on the concept of optimal model of development mentioned above, development has two personalities: 1) an optimal personality when all factors are present in an active form as in model D7; and 2) a non-optimal personality when at least one factor has a passive role as in models D1 to D6. In other words, from all the above seven models only D7 is an optimal model of development reflecting the characteristics of true sustainability or strong sustainability.

vi) The different faces of sustainable development(SD)

Based on the definition of sustainable development(SD) used in this research, it includes all models of development, which do not have all three factors active at the same time. This means that sustainable development(SD) in this view is the same as non-optimal development because it includes all models where at least one factor has a passive role. Hence, sustainable development is not optimal development. On the other hand, one implication of the above discussion is that sustainable development is not unique and it reflects sustained states of development. The six different faces of sustainable development are listed below:

D1 = SD1 = Abc = Deep socio-centric development model
Society goals are dominant

D2 = SD2 = aBc = Deep Market-centric development model
Economic goals are paramount

D3 = SD3 = abC = Deep eco-centric development model
The environment only matters

D4 = SD4 = ABc = Socio-economic development model
Social and economic concerns matter

D5 = SD5 = AbC = Socio-ecological development model
Social and ecological concerns matters

D6 = SD6 = aBC = Eco-economic development model
Ecological and economic concerns matters

One of the implications of the above six models is that sustainable development(D) allows for development to take place in the absence or passive presence of one or two factors, which make it a term consistent with the concept of weak sustainability described above in which system-system dominance is present, and capital substitutability widely promoted. Notice that in all sustainable development models the passive or inactive factors are used to sustain all active factors. As a result of the above it can be concluded that sustainable development is not optimal development.

On the other hand, each of the six models above indicates sustainable development reflects forms of development that can be sustained or that sustainable development refers to any form of sustained development. The two most well known sustainable development models are D2 and D6. Model D2 is known as the neo-classical model of economic development, where the society and the environment are used to sustain economic growth programs. Model D6 is known as the eco-economic development model, the dominant paradigm today, where society is used to sustain eco-economic development programs. On the other hand, a socialist country would reflect model D1; deep ecology would reflect model D3; countries seeking to balance social and economic goals would reflect model D4; and countries seeking to pair social and environmental goals would reflect model D5.

vii) The unique face of sustainability

Based on the definition of sustainability(S), it takes place only when all three factors or forces driving the development system play an active role. Hence, sustainability(S) is equivalent to optimal development since:

*

D = S = ABC = D7

The sustainability model indicates that development is sustainable only if it is optimal development.

By comparing the sustainability model and the different sustainable development models, we can conclude that sustainable development is not sustainability, and that both are different forms of development. Sustainable development is non-optimal development while sustainability is optimal development. This is true because sustainability(S) does not take place when factors have passive roles. Therefore, sustainability is a term consistent with the concept of strong sustainability described above in which system-system dominance does not exist. However, sustainability in the above model is maintained by internal system adjustments in response to the dynamic processes taking place in the other systems. As a result of the above, the

sustainability model can be called the socio-eco-economic development model. Finally, the sustainability model can be used to indicate how close or far the different sustainable development models are from optimality. For example, by determining the optimality gap or sustainability gap, the distance between specific sustainable development models and sustainability, we can assess how far we still need to go to achieve optimality.

Conclusions

There are seven specific conclusions that can be derived from the above analysis: a) Development has 7 different faces; b) Sustainable development and sustainability are two different personalities of development; c) Sustainable development is not unique as it reflect all forms of sustained development; d) Sustainable development is not optimal development; e) Sustainable development is not sustainability; f) Sustainability is consistent with the concept of strong sustainability; and g) The resulting sustainability model can be used to understand optimality gaps or the necessary and sufficient conditions for the existence of optimal development.

There are five general conclusions that can be stated: a) The proposed ABC development model based on qualitative comparative dichotomy variables provides a simple way to state all the possible types of development; b) Sustainable development models can be seen as different development paths toward sustainability; c) The sustainability model can be used to determine how close or far sustainable development models are from optimal development; d) A better understanding of the different types of development models being pursued often at the same time would facilitate planning, monitoring, and evaluation activities at the local/regional level; and e) Sustainable development reflects all forms of sustained development.

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