

Mapping sustainable development in a capability perspective

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Abstract

The importance of the notion of sustainable development has been advocated, among others, by Amartya Sen. In Sen's view it is necessary to depart from the general strategy of defining sustainable development only in terms of fulfilment of needs and to use the broader perspective of enhancing human freedoms on a sustainable basis. The ultimate goal of this paper is to outline a possible operative map of sustainable development as intended in the capability approach.

Our proposed operative outline concentrates on the role of instrumental freedoms and institutions, and it is based on the traditional themes – economic, environmental and social – of sustainability. For each considered theme we select a set of variables and frame them in the driving forces, response and state variables framework. State variables represent constitutive freedoms, the achieved functionings chosen from the capability set. Their variations are produced by driving forces variables. The latter are, in turn, influenced by response variables as triggered by institutional efficiency and effectiveness, upheld by instrumental freedoms. We eventually map each set of variables in order to point out how instrumental freedoms and institutions influence sustainable human development.

JEL: I31

Keywords: Capabilities, Institutions, Instrumental Freedoms, Sustainable Development

♦ The paper is a joint effort of both authors. Nonetheless, Marco Grasso wrote sections 1 and 2. Section 3 was written by Enzo Di Giulio. The maps of section 3 were built up together.

Introduction

The view that the traditional utilitarian notion of welfare can render only a partial picture of human well-being is nowadays quite widely accepted by social scientists. In fact this conception relies only on the welfarist criteria of utility (in theory) and income (in application). The consequent measurements of welfare are generally derived through the observation of preferences revealed by actual choices, and interpreted in terms of the numerical representation of these choices¹. Therefore the notion of welfare reflects only the class of differences captured by money metric, under the economic rationality of self-interested utility maximization. Moreover, the income approach to well-being does not account for the diversity in human beings and for the heterogeneity of contingent circumstances². Thus, income can be intended only as a means to reach an acceptable standard of living, and in no way as an end in itself. There are other important dimensions for the flourishing of human well-being – social, environmental and institutional – that allow higher level of development³ that the sole income does not encompass. Including these dimensions and accounting the interests of all present individuals without hampering the possibility of development in the future, it is possible to read well-being as sustainable development: a model of development which advances economic and social justice, protects the environment, strengthens institutional capacities.

According to the Bruntland Report (1987), the sustainability of development must satisfy the condition to fulfil «the needs of the present without compromising the ability of future generations to meet their own needs». The importance of this notion has been advocated, among others, by Amartya Sen, who pointed out that «it cannot be doubted that the concept of sustainable development, pioneered by Bruntland, has served as an illuminating and powerful starting point for simultaneously considering the future and the present» (Sen, 2002: 1). In Sen's view it is necessary to move a step further. In fact he has always stressed the centrality of individual entitlements, opportunities, and rights as conceptual foundations of economics and social choice, developing an approach⁴ focused on the freedom of individuals to pursue their own project of life, in which well-being is seen «in terms of a person's ability to do valuable acts or reach valuable states of being» (Sen, 1993:30). In this context Sen suggests to depart from the «general strategy of defining sustainable development only in terms of fulfilment of needs» and to use the «broader perspective of enhancing human freedoms on a sustainable basis» (Sen, 2002: 2).

This perspective of sustainability is deep-rooted in the capability approach, whose strength in fact does not simply lie in the enlargement of the evaluative spaces, but mostly in the redefinition of the concept of well-being itself. This broader notion stresses the importance of enjoying enduring essential freedoms to reach a specific project of life, dependent at the same time on a number of contingent circumstances. Given the rich array of issues and of levels, the operationalization of the capability approach in a sustainability framework is far from being straightforward. Anyway, Sen himself, though acknowledging the empirical difficulties, ascribes significant importance to the practical usability of the theory he has illustrated: «the approach must nevertheless be practical in the sense of being usable for

¹ In the traditional utilitarian framework (from Bentham, to Edgeworth, Marshall, Pigou), the concept of utility is only a matter of pleasure, happiness, desire fulfillment. The main limit of this view is that utility is seen in terms of mental metric, highly subjective and therefore possibly misleading. In the modern choice theory utility is seen simply as an "index" of individuals' choice, whose ambiguity makes impossible direct interpersonal comparisons. More generally, Lionel Robbins remarked the greatly problematic availability of information for interpersonal comparisons of utility required by utilitarianism which made this approach almost unworkable.

² A complete critique of the pitfalls of utilitarian approach is however beyond the goals of this paper.

³ In this perspective development is seen as an equitable improvements of well-being (or, more generally, of the quality of life). The idea of development dates back to the second half of the twentieth century: before that period the main goals of countries were economic growth, progress and modernization, while there were little room for social, environmental and institutional issues.

⁴ See, for instance, Sen 1980, 1985, 1987(b), 1992, 1999.

actual assessment» (Sen, 1987(b):20). For this reason he has provided a possible formalization (Sen, 1985), that turns the capability approach into a fully-fledged economic theory, besides being a field of interest to philosophers and scholars of development studies.

Section 1 addresses the issues of sustainability according to the capability approach. Section 2 investigates the questions of the operationalization of the Senian notion of sustainable development both at theoretical and methodological level. Section 3 maps the operative framework of sustainable development according to the capability perspective. Finally, the concluding remarks briefly underline the main points of the work.

1 The capability approach and sustainable development

The notion of sustainable development is widely used, often misused, and thus difficult to clearly identify. We do not try here to define the principle, nor to recognize its main aspects. We simply intend to read sustainable development through the lenses of Sen's capability approach, in order to propose a possible consequent operative framework. Actually the capability perspective has been used for analysing a number of social issues: well-being and poverty, liberty and freedom, living standards and development, gender bias and sexual division, justice and social ethics (Sen, 1993: 30, note 1).

In the capability approach well-being deals with the enlargement of individuals' constitutive freedoms: nonetheless it is worth to briefly clarify its ramified dimensions to better understand its connections with the more pervasive concept of sustainable human development. Well-being in Sen's language refers to a personal situation in term of achieved functionings and includes also sympathy, a concern for others' achieved functionings (or *others'* well-being). It must be distinguished from the notion of agency, which, taking into account commitment, is more inclusive insofar it relates also to the willingness to actually support other individuals in pursuing their projects of life regardless of the impacts on one's own well-being. Moreover, Sen pointed out a narrower notion, namely the standard of living, which involves only the aspects of well-being regarding «the nature of his own life, rather than [from] "other-regarding" objectives or impersonal concerns» (Sen, 1993: 37). Therefore, when dealing with sustainable human development, it would be more appropriate to refer to the notion of agency, because the latter considers a real social commitment closer to the *more choice* implied by the notion of sustainable (ie *enduring*) human development, then to the concept of well-being, which includes only a sort of proximity to other individuals. So, basically, we use the term well-being interchangeably with sustainable human development, instead of the more appropriate agency to keep on with the traditional vocabulary of the literature on the argument.

Development, according to Sen, implies the broadening of human potential: individuals are the ends of development, rather than the mere means. This notion of development is focused on the expansion of opportunities and individual choices, of the real freedoms people enjoy in order to live the lives they value. In a word, it is an expansion of the set of capabilities. This focus has profound roots in philosophy and classic economic theory, which both in fact took extensive note of the issue of human development: «The approach [to human development] reclaims an old and established heritage, rather than importing or implanting a new diversion» (Anand and Sen, 1994b: 3). More generally, Sen's work has obvious relations with Aristotle's human flourishing and «strong connections with Adam Smith's analysis of "necessities" and conditions of living» (Sen, 1999: 24), concerning the ability of people to choose a reasonable life. In this perspective human development is essentially a moral concern in which ethical questions are unavoidable. Therefore in Sen's view of development individuals are not simply people with needs, but they are «agents of change who can – given the opportunity – think, assess, evaluate, resolve, inspire, agitate, and through these means reshape the world» (Sen, 2000: 1).

This perspective of freedom enhancement is at the very hearth of Sen's analysis. In brief the so-called capability approach requires «a broader informational base, focusing particularly on people's capability to choose the life they have reason to value» (Sen, 1999: 63), to highlight the social and economic factors which give people the opportunity to do and to be what they consider valuable for their fulfilment. Thus the capability approach concentrates directly on the substantive freedoms of the individuals involved. In this sense, Sen suggests that well-being be considered in terms of human functionings and capabilities. Functionings relate to what a person may value doing or being: they are

the living conditions achieved by an individual and represent a set of interrelated activities and states (“doings” and “beings”) that form her life. Capabilities concern the ability of an individual to achieve different combinations of functionings, and define the freedom to choose the life that she prefers. These two categories are complementary but however distinct: «A functioning is an achievement, whereas a capability is the ability to achieve. Functionings are, in a sense, more directly related to living conditions, since they are different aspects of living conditions. Capabilities, in contrast, are notions of freedom, in the positive sense: what real opportunities you have regarding the life you may lead» (Sen, 1987: 36). All the theoretical issues concerning this approach have been satisfactorily investigated in Sen’s work and in the related literature, and it is not the point of this paper to reconsider them. Rather, here we aim to explore the possibility of mapping sustainability according to Sen’s view.

Sustainable human development, as pointed out, can be generally intended as an increase in the quality of life, both equitable and durable. In this sense «[the human development approach] applies ...to the freedom to lead lives that people today *and in the future* value» (Anand and Sen, 1994b: 6, emphasis added). Therefore it is not surprising that Sen himself defines sustainable development «as development that promotes the capabilities of present generation without compromising capabilities of future generations» (Sen, 2000: 5). It is in fact a point of view strictly consistent with the extension from the fulfilment of needs to the enhancement of human freedoms in a sustainability perspective.

At the same time sustainable development as intended by Sen owes very much to the Brundtland’s notion: the latter too, in fact, includes consideration on the quality of life of each future generations, combined with concerns of intragenerational equity, and pays attention to the ability of meeting ones’ own goals. The very difference between the two approaches lies in the evaluative conception. The Brundtland’s approach views human beings only in terms of needs and fulfilment, Sen’s one underlines the importance of freedom to enhance human capabilities: «[So. That is,] if you broaden sustainable development as sustaining the freedoms that people have, expanding freedoms and sustaining the freedoms that we have, I think we can get an adequately broad view of it. And that is the direction I would like to push the sustainable development literature to go. And it is an important distinction because quite often on the ground that ends justify the means - a very bewildering sentiment - people do things, recommend policies in the name of sustainable development, that begin by obliterating something very worth sustaining, namely human freedom.» (Massarenti, interview with A.K. Sen, 2000).

To sum up, Sen suggests that human development coincide with the expansion of capabilities («...[a] development that promotes the capabilities of present people...», Sen, 2000: 5). If this enlargement of the space of choices is expected to hold in the future («...without compromising capabilities of future generations», *ibid*: 5) it is possible to refer to it as sustainable (human) development. Finally, in a practical perspective, Sen suggests that «In detailed application, a general idea of this kind [ie sustainable development] can, of course, be combined with more precise articulation (taking contingent note of the availability of data and information», *ibid*: 3). Therefore in the following sections we outline a possible operative route to map sustainable development as intended in the capability approach.

2 Making sustainable development work

2.1 The operationalization of the capability approach

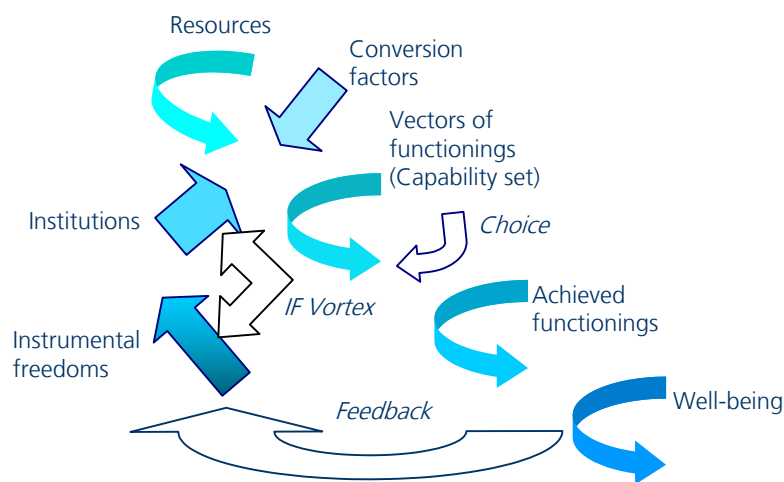
By operationalization we mean all the steps between a theory and its empirical application. Such a process relies on the translation of theoretical concepts into empirical ones, which eventually become empirical variables usable in quantitative and non-quantitative analysis.

It is worth to point out that we consider the capability approach primarily as a method for making interpersonal comparison of well-being. Indeed, in Sen’s intention it has a far wider significance: it is first of all a framework of thought, which aims to highlight the drawbacks of other approaches in identifying and defining well-being and human development. Since Sen’s interest seems to be mainly concerned with this foundational level, he has never provided a formula or path to carry out welfare

and development measurements and comparisons⁵. Actually, incompleteness is not surprisingly a distinctive characteristic of the capability approach, for the latter depends on the context, which is as ambiguous and complex as human life and values are.

In general, Sen's approach requires the translation of resources into valuable beings and doings (ie functionings), from which the various combinations of achievable functionings may be chosen (this possibility of choice forms the space of capabilities). In other words, resources, sifted by personal and social conversion factors, allow the attainment of a number of beings and doings, which may be represented by the vectors of achieved functionings⁶ (or the capability set). Moreover, the conversion of resources into functionings is supported by a set of instrumental freedoms, which promote and enhance institutional efficiency and effectiveness and thus uphold the success of the translation process (we call this complex connection "the Institutions-Freedoms – or IF – vortex"⁷). Finally, the choice of a specific subset (a vector) of functionings generates a given level of well-being, which in turn can eventually "tune-back" institutions and their responses.

Figure 1 - The capability approach: a general view



We think that this schematic, and intrinsically dynamic representation as the capability approach itself, is quite consistent with Sen's view of well-being: «We use incomes and commodities as the material basis of our well-being. But what use we can respectively make of a given bundle of commodities, or more generally of a given level of income, depends crucially on a number of contingent circumstances, both personal and social» (Sen, 1999: 70). These different contingent circumstances «make opulencea limited guide to welfare and the quality of life» (ibid: 71).

In order to operationalise the capability approach we must introduce a major simplification⁸: we restrict the model to the space of the chosen vector of functionings. In doing so we avoid the issue of the measurement of capabilities, and bypass the problem of their unobservability⁹. Therefore, we too stick to Basu's suggestion – reported in Brandolini and D'Alessio (1998:15) –: «...to go along with Sen and evaluate well-being on the basis of functionings, but be content with achievements, instead of capabilities». Sen himself suggests that at a practical level the most appropriate focus of attention should not always lie in the measure of capabilities: «Some capabilities are harder to measure than

⁵ With great disappointment of those who have looked into Sen's writings for these "recipes".

⁶ Achieved functionings could be alternatively seen as an elementary valuation of the capability set. In this sense – only in this sense – functionings and capabilities coincide.

⁷ The expression "Institutions-Freedoms vortex" is taken from Chopra, Duraiappah (2001).

⁸ We are aware of other areas of incompleteness with respect to the foundational theory. For thorough and yet synthetic analysis of the capability approach, see for instance Gasper (2002), Robeyns (2000), Saith (2001).

⁹ In fact their potential nature can become actual only after an individual's process of choice.

others and attempts to putting them on a “metric” may sometimes hide more than they reveal» (Sen, 1999: 81). Furthermore, the chosen vector of functionings could be seen as an elementary valuation of the capability set, which depending on the appropriate choice of the elements of the vector (eg assuming a maximizing behaviour), can in turn be considered as the maximally valued one¹⁰: «the focusing on a *chosen functioning vector* coincides with concentration on the *capability set*, since the latter is judged, ultimately, by the former.» (Sen, 1999: 76 – emphasis in the original).

From a theoretical point of view the reference unit of the capability approach is the individual, functionings and capabilities being in fact properties of individuals. More specifically, Sen moves in the space of moral individualism and considers the individual as the only unit that counts when evaluating social states, avoiding at the same time to reduce society to the mere sum of individuals and their properties, as set by ontological individualism. In other words, the use of different units of analysis (groups based on age, gender, administrative boundaries or other elements) in the empirical work points out intergroup variations, but according to Sen (1992: 117, n.1) the focal point of the analysis remains the individual, since the interest in group is only derivative (ie regarding the differences among individuals placed in different groups) and not intrinsic (ie regarding the differences between groups seen as unique bodies). Nonetheless, Sen’s moral individualism does not forget that the human being is a *zoon politikon*, insofar her evaluative process is shaped by a number of social elements, such as the social conversion factors and, mainly, the IF vortex. Indeed in Sen’s words, as pointed out by some observers, there is a deep interest for the institutional basis of human life, and his concern for the individual seems rather formal, or at least instrumental, insofar individuals are member of a community (Comim 2001: 9). For these reasons it is possible to use the capability approach to assess social well-being, that is some form of aggregation of individuals’ well-being¹¹. The rationale for this shifting to an aggregate reference unit can be usefully found in Dasgupta (1999:11): «Aggregate well-being for a given cohort of people will then be regarded to be the average well-being of the cohort. The thought-experiment I invoke to do this is the now-familiar conception due to Harsanyi (1955), in which the standard of living in a society is deduced to be the expected living standard of someone who had equi-probability of finding themselves in the place of each member of society». Using an aggregate number (a scalar) certainly provokes the loss of important information about individual circumstances (a vector). In other words, focusing the capability approach at a macro level indeed implies the losing of the keener in-depth perspective of individual analysis. But this is the price we have to pay to obtain a policy tool, which hopefully could be useful for a keener comprehension of sustainability dynamics over time.

Sen himself in applying the capability approach refers to regional, national, sub-national, or group data. For instance, when examining poverty and deprivation in India and Sub-Saharan Africa (Sen, 1999: 99-104), he draws on national and sub-national level data. Or, when dealing with gender inequality, he works both with different territorial level and group data (Sen, *ibid*: 104-107).

2.2 A general outline: on the shoulders of giants

The operationalization of sustainable development according to Sen’s view requires the monitoring of the evolution of capabilities over the time. Capabilities are hard to grasp: thus, as pointed out earlier, the chosen vector of functionings is the most convenient alternative in operative exercises. Nevertheless the selection of functionings and their aggregation are fundamental but troublesome issues in any operative attempt. In general, the broader the evaluative space, the closer we get to the inclusion of all possible elements of well-being. Unfortunately, at the same time, the larger will be the informational basis required.

¹⁰ In this perspective the value of the capability set is that of a single element of the set itself, the maximally valued one. But this view holds if freedom is considered mainly in its instrumental meaning, and not in its substantive one. In this latter case we inevitably should have pushed our analysis to the capability set, with all the problems deriving from unobservability and from the increase of information required.

¹¹ Sen (1991: 15-16) points out that this is a non-welfarist approach to the assessment of what standard economic theory defines social welfare.

Therefore, the trade-off between the wish of portraying a comprehensive picture of sustainable human development and the possibility of managing the informational complexity, can only be solved by choosing a compromise alternative. If a balance between completeness and complexity had to be found, we have to rely on a minimum set of functionings as main dimensions of well-being¹². Sen has never provided any list or guideline for the definition of this subset, stressing on the contrary that it varies through time and across space, according to intrinsic characteristics of people concerned, to prevailing social costumes and cultural norms, and to economic factors. Hence the operationalization of the capability approach remains basically a matter of pragmatism: «The foundational affirmation of the importance of capabilities can go with various strategy of actual evaluation involving practical compromises. The pragmatic nature of practical reason demands this» (Sen, 1999:85). In fact, given the openness and the flexibility of the capability framework, its operationalization is highly context-dependant, and there is no “right” or “complete” or even “better” list of functionings. It is the social, political and economic environment, the purpose of the applicative exercise, and other practical constraints which shape both the evaluative space and the relative importance of its elements. Hence the capability approach can be used in different ways depending on the context and cannot be rigidly formulated because it is intentionally an open and flexible framework. In Sen’s words: «The answer to these questions [Which functionings are we to select? How do we weigh them vis-à-vis each other?] must surely depend on the purpose at hand.There is no need here for different people, making their respective judgments, to agree on the same list, or on the same weight for the different items; we are individually free to use reason as we see fit. A framework for the analysis of well-being is just that – not a complete solution of all evaluation problems, nor a procedure for interpersonal agreement on relevant judgments.» (Sen, 1996:116).

In our approach we deal with this problem by staying on the shoulders of giants, namely the Human Development Report Office (HDRO), for the three-legged framework of the Human Development Index (HDI)¹³, and the United Nations Commission on Sustainable Development (UN-CSD), for identifying the three legs (environmental, economic and social) and the role played by variables (state, driving force, response). Therefore we do not consider the whole sequence from resources (commodities/endowments), to their conversion into functionings and capabilities and eventually into choices augmenting well-being, briefly summarized in the previous section¹⁴. Rather, we take it for granted and work on a more general level, referring to solid practical “benchmarks”, namely the HDI and the UN-CSD framework.

We are aware that our choice of relying on this three-legged framework may not be the ultimate solution. Nonetheless we consider it very important to overcome the dictatorship of GDP and to offer new and wider perspectives to human development policies. Consequently, our scheme is not supposed to be *the* measure of sustainability, but it may be a useful reference to stimulate the debate on the role of institutions in the road towards sustainability, and can hopefully shed light on some particular aspects of sustainability itself. Thus, to stay with Sen, it is useful to consider our framework a possible direct approach of well-being measurement that can be employed for «“distinguished capability comparison”, involving the comparison of some particular capability chosen as the focus, without looking for completeness of coverage» (Sen, 1999: 82).

Ideally, in the definition of a framework of welfare measurement it is necessary to make use of indicators, intended as «statistic of direct normative interest which facilitates concise, comprehensive and balanced judgments about the condition of major aspects of a society. It is in all cases a direct measure of welfare and is subject to the interpretation that if it changes in the “right” direction, while other things remain equal, things have gotten better, or people are “better off”» (Olson, 1969:97). Generally, indicators, which are the ultimate goal of the operationalization, are preceded by empirical variables, which in turn are the result of the translation of theoretical concepts. In our framework, due

¹² Some literature includes income-related functionings. In our picture income is a means to well-being, and matters only instrumentally to the extent that it can help to acquire functionings and capabilities.

¹³ The elements of HDI, as the ones we selected, can be seen as the chosen vector of functionings and eventually as the maximally valued elementary set of capabilities.

¹⁴ More details on this process can be found in Grasso, 2002(a).

to lack of available data and functional relationships between data, we halt at the level of variables. In our opinion such a lack of knowledge (data and functional relationships) is the crucial obstacle to any effective operationalization of Sen's theory. This does not mean that the capability approach is not suitable for an operationalization, rather a conspicuous amount of work, eg through wide international research programs and networks, would be necessary.

More in detail, we select different sets of variables according to the dimensions of sustainability proposed by the UN-CSD's theme/sub-theme framework¹⁵ (UN-CSD, 2001). For each considered theme – we call it a building block – we select a set of variables and frame it in the three families depicted by the UN-CSD: driving forces, state and response. We map each set of variables in causality relationships. State variables are determined by driving force variables: the institutional reaction, triggered by the Institutions-Instrumental Freedoms (IF) Vortex is determined by induced variations of response variables, which in turn produce some reactions in driving force variables and so on. These cyclical dynamic relationships between variables avoid to freeze the process in a static sequence of subsequent changes¹⁶.

2.3 Theoretical underpinnings

The theoretical underpinnings of the model sketched are two-tiered. On the one hand the general picture is grounded in the synthesis of HDI and UN-CSD frameworks, on the other hand the building blocks (ie the driving force-state-response variables) deal with the instrumental freedoms Sen points out in order to expand human development, and more generally with the foundational issue of the capability approach.

Since we borrowed from HDI and UN-CSD frameworks only the general outlines, it is not worth to point out here their wider theoretical strengths and weaknesses. Instead it is more important to set the skeleton depicted above for the building blocks in the context of the capability perspective. According to Sen, the appropriate evaluative space of well-being is neither the one of utilities, nor the one of basic needs, «but that of the substantive freedoms – the capabilities – to choose a life that one has reason to value» (1999: 74), which is in a sense akin to the «common concern with quality of life» (ibid: 24). In our translation it matches with the space of state variables. Thus freedom, as stressed by classical economists (Smith, Stuart Mill, Marx), is both the basis of development and its principal end. The notion of freedom is pervasive in the capability approach: in earlier works positive freedom used to be the privileged dimension, while in Sen's latest writings – and especially in the book "Development as Freedom" – the focus seems to be on the instrumental role of both positive and negative¹⁷ freedom.

The building blocks rely heavily on the dimension of freedom that allows actions and decisions. According to Sen, this notion of freedom – seen, at least at theoretical level, in a sufficiently ample way – is very important for development due to an effectiveness reason: «achievement of development is thoroughly dependent on the free agency of people.» (ibid: 4). It is worth pointing out that there is another fundamental dimension of freedom that deals with the actual opportunities of people. Its centrality lies in the evaluative reason of underscoring the progress in the enhancements of freedoms themselves. Thus freedom is both appropriate procedures and adequate opportunities. Furthermore a distinction between constitutive and instrumental freedom must be done. In the first perspective freedom is the primary end of development, and it can be considered the substantive

¹⁵ Specifically we use three out of four themes of UN-CSD: the environmental, the economic, and the social ones. We omit a fourth, the institutional, since institutions, in the capability approach, play a crucial role as tools of constitutive freedom and thus determine the dynamic of every area of analysis – environmental, economic, social.

¹⁶ If we could simulate over the time (eg by means of systems dynamics) hypothetical and/or experimental variations of the indicators associated with response variables (ie the institutions, the levers of policy-makers, or in our framework of the IF vortex) or of other sensitive variables, it would be possible to monitor the evolution of state variables and of relative indicators over the desired time horizon.

¹⁷ According to Qizilbash (1996: 148), one of the capability approach's major pitfall is its inadequate account of negative freedom. In our opinion this sensible remark has been partly overcome in Sen's latest writings.

freedom of enriching human life through the expansion of capabilities¹⁸. This is again, in our language, the domain of state variables. On the other end the instrumental notion considers freedom as the principal means of development. This distinctive instrumental role of freedom «concerns the way different kinds of rights, opportunities and entitlements contribute to the expansion of human freedom in general, and thus to promoting development» (ibid: 36). In this sense the institutional aspects of development become crucial, emphasizing the contribute of institutions to the broadening of capabilities: «Individuals live and operate in a world of institution. Our opportunities and prospects depend crucially on what institutions exist and how they function. To see development as freedoms provides a perspective in which institutional assessment can systematically occur.» (ibid: 142). In other words, the level of constitutive freedom depends on the role played by institutions, in their broadest sense.

In order to manage the drivers that may promote development, people need different freedoms to make institutions work (or simply to strengthen them). Therefore institutions represent the space of instrumental freedoms: through institutions people (or more likely their representatives¹⁹) can intervene to enlarge the capability set. Or, the greater the institutional freedoms, the wider the constitutive freedoms. Instrumental freedoms and their deep linkages with institutional efficiency and effectiveness²⁰, are represented in our building blocks by the IF vortex.

The families of instrumental freedoms that influence the impacts of institutional action on the drivers of change are pointed out by Sen (1999:38-40), though the list provided should not be considered exhaustive:

1. *political freedoms* relate to the opportunity of people to participate in the public debate and to determine who should govern;
2. *economic facilities* relate to the opportunities that people have to utilize resources for consumption, production and exchange;
3. *social opportunities* are the arrangements society makes for education, environmental quality and so on, to allow better lives all the individuals;
4. *transparency guarantees* relate to openness and trust, with the freedom to mutually deal under guarantees of prevention of corruption and the likes;
5. *protective security* consists in the provision of social safety nets to protect individual from hopeless poverty.

To sum up, state variables of our building blocks are the constitutive freedoms (ie the achieved functionings chosen from the capability set). Their variations are produced by driving forces variables. The latter are in turn influenced by response variables as triggered by institutional efficiency and effectiveness, enhanced by instrumental freedoms (the IF vortex).

There is a theoretical weakness in the process we sketched. In fact, instrumental freedoms must complement one another. These connections are central to understand the instrumental role of freedoms themselves: «The claim that freedom is not only the primary object of development but also its principal means, relates particularly to these linkages.» (Sen, 1999: 38). But, at this empirical level, we do not look for the completeness of the model, rather we proceed on the analysis of each single building block independently. Therefore, in our opinion, the whole representation is not undermined by this deficiency.

¹⁸ It is therefore possible to consider this notion of constitutive freedom synonymous of capabilities.

¹⁹ Institutions should ideally be developed through a democratic and participative process. We are aware that they are far from perfect, as the public choice theory has pointed out, their drawbacks ranging from inefficiency to rent-seeking. Nonetheless, for the purposes of this paper, we postulate a direct relationship between their efficiency and effectiveness and constitutive freedoms.

²⁰ In general it is possible to intend for efficiency the relative unit costs – mainly transaction and transformation costs (North, 1994: 3) – at which the institutions are undertaking their activity. The effectiveness is instead the extent to which institutions are accomplishing their purposes.

2.4 The role of institutions

«[T]he great differences in the wealth of nations are mainly due to the differences in the quality of their institutions» (Olson, 1996:19). Institutions play a pivotal role in affecting individuals' freedom to pursue their own project of life and eventually in determining human development. In principle, the degree of freedom is greater when institutional efficiency and effectiveness increase.

We do not intend institutions only *stricto sensu à la North* as structure²¹, and players²². Rather we adopt a wider notion of institutions, very similar to the broadest definition of social capital²³, which includes «the social and political environment that enables norms to develop and shapes social structure» (Grootaert, 1997: 3), in short «the norms and networks that facilitate collective action.» (Woolcock, 2000: 8). Therefore institutions have both informal and formal dimensions. The former refer to the horizontal and vertical associations of individuals in social networks: from trust to shared values and religion. The latter refer to institutional relationship and structures such as the rules and the laws, and the procedures and organizations to shape and enforce them. And their role isn't limited to social aspects, but deals also with economic issues such as the performance of markets and of the economy.

Table 1 - Institutions

INSTITUTIONS			
Social Capital	Structures		Organizations
	<i>Informal</i>	<i>Formal</i>	
Trust	Rules	Regulations	Government agencies Firms
Shared values		Laws	Civil society organizations Police
Religion	Traditions	Constitutions	Courts
Informal			Formal

Source: adaptation from World Development Report 2003

The Senian perspective of sustainability stresses the importance of a long-term enhancement of capabilities. If this objective is straightforward from a theoretical point of view, there are still major difficulties about the institutional efficiency and effectiveness needed in favouring sustainability practices, namely regarding the function that institutions play in improving policy coherence and integration for the pursuit of sustainable human development. In fact sustainability entails institutional challenges, which in turn claim better integration of economic, environmental and social issues within the mandate of institutions themselves.

There are certain preconditions for the success of the practices of sustainability, such as *a) good governance* and *b) sound public management*. Besides, there are criteria that determine institutional efficiency and effectiveness in sustainability matters. In particular we refer to the following categories²⁴: 1) *long-term planning horizon*, 2) *delivery of public goods*, 3) *cost-effectiveness*, 4) *environmental effectiveness*, 5) *integration*.

A *long-term planning horizon* is more likely to favour the sustainability of institutional action, which at the same time needs to deal properly with the *delivery of public goods*, presenting often such characteristics. Moreover *cost-effectiveness* (ie the minimization of economic costs) and *environmental effectiveness* (ie the minimization of environmental impacts) are important elements of institutional effectiveness and efficiency: the first in fact implies the possibility of setting more ambitious targets for

²¹ «Structures that humans impose on human interaction and therefore define the incentives that (together with the other constraints) determine the choices that individuals make that shape the performance of societies and economies over time.» (North, 1994: 1-2).

²² «...groups of individuals engaged in purposive activity.» (North, 1994: 3).

²³ Or, in another perspective, the traditional definition of institutions of North, plus the most narrow notion of social capital of R. Putnam (social networks and related rules).

²⁴ These categories are an excerpt of the ones presented in OECD 2001, Box 2, pages 8-9.

the future, while the latter prevents the depletion of a basic element of sustainability, natural capital. Finally, sustainable development goals require the *integration* of multiple issues in coordinated decision-making processes.

The focus on the five above-mentioned criteria allows to put in place successful strategies of sustainable development and thus to increase the efficiency and effectiveness of institutions. In order to further extend institutional role in converting commodities into human development is necessary to rely on a series of enabling conditions, the five Senian instrumental freedoms. The absence or the limitation of these freedoms in fact weaken the institutions and hamper the conversion process.

In Sen's view the promotion of sustainable development intended as enlargement of freedoms that people enjoy, requires the expansion and the strengthening of freedoms. Therefore, the level of constitutive freedom (ie of capabilities) depends on institutional efficiency and effectiveness, which in turn depend on the different degrees of instrumental freedoms. All these complex relationships are subsumed in the IF vortex.

3 The operative framework

3.1 Generalities

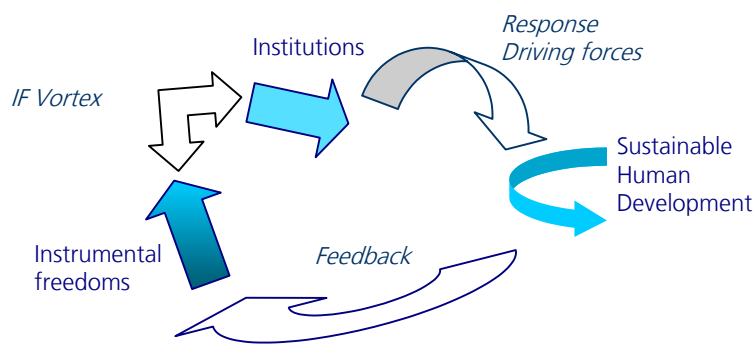
As above mentioned, our proposed model is grounded in three themes: the environmental, the economic and the social. In general, in the choice of these themes a great deal of value judgment is required. Ideally a particular selection should be made explicit by the broadest possible involvement in decisional processes of democratic institutions or by public participation and debate. As aforementioned, we pass over the problem of individuating the dimension of sustainable human development by sticking on the choices of UN-CSD, a democratic institution under public scrutiny, whose role is deliberately to promote sustainable development, and whose proposed structures of analysis were suggested by the Expert Group on Indicators of Sustainable Development «with the background of the national testing experiences and the overall orientation to decision-making needs» (UN-CSD, 2001: 12)

State variables «provide a reading on the condition of sustainable development» (ibid: 11), or, more specifically, a particular aspect of it at a given point in time. In the capability approach vocabulary they stand for the space of capabilities or constitutive freedoms. «The term driving force represent human activities, process and patterns that impact on sustainable development either positively or negatively» (ibid: 11). These variables point out the causes of positive or negative change affecting sustainability. Finally, «response variables represent societal actions aimed at moving towards sustainable development». They provide a measure of the reaction of societies to changes in sustainable development and they can be intended as a product of the interrelated dynamics of instrumental freedoms and institutions, that is of the IF vortex.

3.2 The building blocks: an overview

Our proposed operationalization does not consider, as already said, the whole process of conversion of resources into well-being/human development put forward by Figure 1. It works on an aggregate level, where personal conversion factors are out of the picture, while the social ones are subsumed in the IF Vortex. Moreover it aims essentially at pointing out how institutions, and the freedoms they imply, work within a capability perspective. Therefore our proposal explodes the general framework detailing the IF vortex and its influences on state variables, via response variables and driving forces

Figure 2 – The capability approach: the “institutions-freedoms” framework



In brief, we link the IF Vortex with state variables (ie with sustainable human development) through response and driving force variables. The elements of Figure 2, whose specifications are given below, set up therefore the building blocks of our model, each one corresponding to a theme (environmental, economic, social) of UN-CSD. They are the following:

Instrumental freedoms

Instrumental freedoms determine the role and the strength of institutions. At the same time their role is dependent on the one of institutions. For instance, the stronger the instrumental freedom Social Opportunities, the better the institutional response to unemployment.

Institutions

Institutional efficiency and effectiveness determine, through response and driving force variables, the width of the space of constitutive freedoms: state variables in the model, or achieved functionings in the capability approach. As pointed out before, institutions at the same time are influenced and influence instrumental freedoms. The deep interconnection between the two (the IF Vortex) originates the levels and the directions of responses and driving forces.

Responses and driving forces

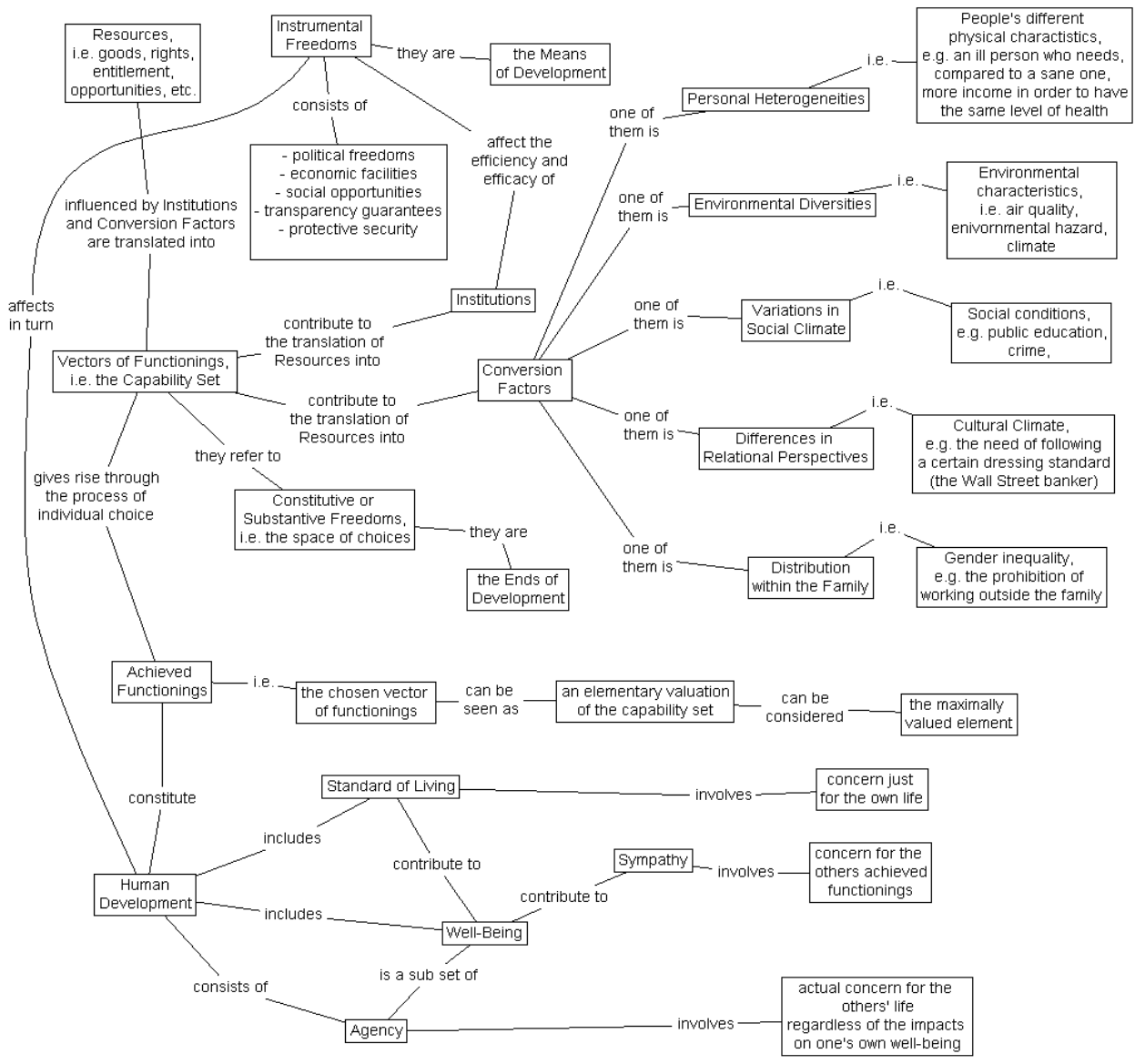
Driving forces are built up by the interrelated and complex links between institutions and instrumental freedoms, and eventually determine the space of capabilities. For instance, an improvement in Energy Efficiency (response variable) lessens Fossil Fuel Consumption (driving force), which ultimately determines the level of Greenhouse Gases Emissions (state variable).

Sustainable Human Development

The achieved functioning (eg Greenhouse Gases Emissions in the above example) is the space of constitutive freedoms, measured in our model by state variables. Achieved functionings (state variables) constitute Sustainable Human Development.

In order to provide a keener insight of the model we present hereafter its internal dynamics in details. Figure 3 provides a synthetical picture of the whole capability approach. Naturally, it must not be seen as a comprehensive framework, rather as a sort of skeleton in which the basic elements and bonds of Sen’s thought are enlightened.

Figure 3 – A map of the capability approach



This picture and the following ones represent a sequential mapping of the notion of sustainable development elaborated according to Sen's approach. To some extent, they can be seen as "zoomed" pictures which enlighten peculiar aspects of sustainability through a sequential deepening, within a Senian perspective. In particular, they focus on the institutions-freedoms vortex (IF vortex) and try to show the way in which such a vortex works. Since these processes does not occur in an abstract world, but is characterised by different features in accordance with diverse situations, we will refer to the three essential fields of sustainability put forward by the UN-CSD, and for each of these three spheres we provide an example.

A fundamental point in Figure 3 is the distinction between Ends and Means of development, that is Instrumental and Constitutive (or Substantive) Freedoms. All the elements of the picture are strictly interrelated and, at the same time, co-operate to the generation of a set of Achieved Functionings and, thus, Development. It cannot be said that one element of the framework precedes another, rather they work contextually and each one affects the other one within a net of relationships and feedbacks. Thus, just for descriptive reasons, we can say that Resources (ie goods, rights, entitlements and opportunities) represent, to some extent, the raw materials of a process which transforms them into Development. In such a transformation, Instrumental Freedoms play a key role. All these elements, whose peculiar role will be showed in details in the next maps, affect the way in which institutions translate Resources into a Capability Set, ie Vectors of Functioning. The transformation of

Resources into Vectors of Functionings is also influenced by some Conversion Factors which incorporate elements related to society, environment, persons and families. For instance, Personal Heterogeneity affects the translation from Resources to Achieved Functionings: a man who has some heavy illness needs more money than a man who is in good health conditions in order to attain the same level of health. Similarly, the conditions of the natural and social environment can narrow or enlarge Substantive Freedoms, which represent the space of choice. Here, we will not discuss more widely these aspects, they being the core of the next maps. We just stress that, given a Capability Set (ie some Vectors of Functionings), the choice of a single individual will determine some Achieved Functionings that, to some extent, can be considered as the individual's maximally valued element. Achieved Functionings constitute Human Development, since in Sen's view the space of choice, to which Functionings refer, is the basis of development.

In the figures that follow we will show six maps which refer mainly to the role played by the IF vortex in three above-mentioned contexts relevant to the concept of Sustainable Human Development: Environment, Economy, Society.

3.3 The environmental building block

We have chosen the case of CO₂ emissions as a useful example to illustrate the role played by instrumental freedoms and institutions within the Senian notion of sustainable development. CO₂ emissions are related mainly to fossil fuels combustion, whose importance grew a lot in the last years. Essentially, this was due to two factors: on the one hand, being related to energy consumptions, CO₂ is linked to the entire economic activity of a society; on the other hand, affecting a global common such as the atmosphere, and in turn climate, the international community decided to cap Countries' carbon emissions. In particular, the Kyoto Protocol, signed in December 1997, states that industrialised countries have to mitigate their CO₂ emissions by the period 2008-2012. Since, as pointed out, CO₂ is crucially related to economic activity and growth, the implementation of policies and measures to meet the Kyoto Protocol targets is giving rise to a wide debate within industrialised countries. This fact makes the case of CO₂ emissions particularly interesting for studying the role played by institutions and instrumental freedoms. In Figure 4, we have sketched the chain through which CO₂ is generated. Our main aim is to enlighten the distinction between state variable, driving forces and agents of response. CO₂ per capita is the state variable, an achieved (dis)functioning. Stimulated by income, fossil fuel consumptions, that is consumptions of coal, oil and gas, are the driving forces of CO₂. The single individual and industry are characterised as agents of response, that is final agents through whom the process of CO₂ mitigation passes. In fact, industry and the single individual can change their behaviour and give rise to either a shift from fossil fuel to renewable energy, or an improvement in energy efficiency (eg through the use of more efficient devices). Such behavioural change is stimulated by the IF vortex. In Figure 5 a detailed picture of such a vortex is provided.

Figure 4 – CO₂ emissions: State variable, Driving forces and Responses map

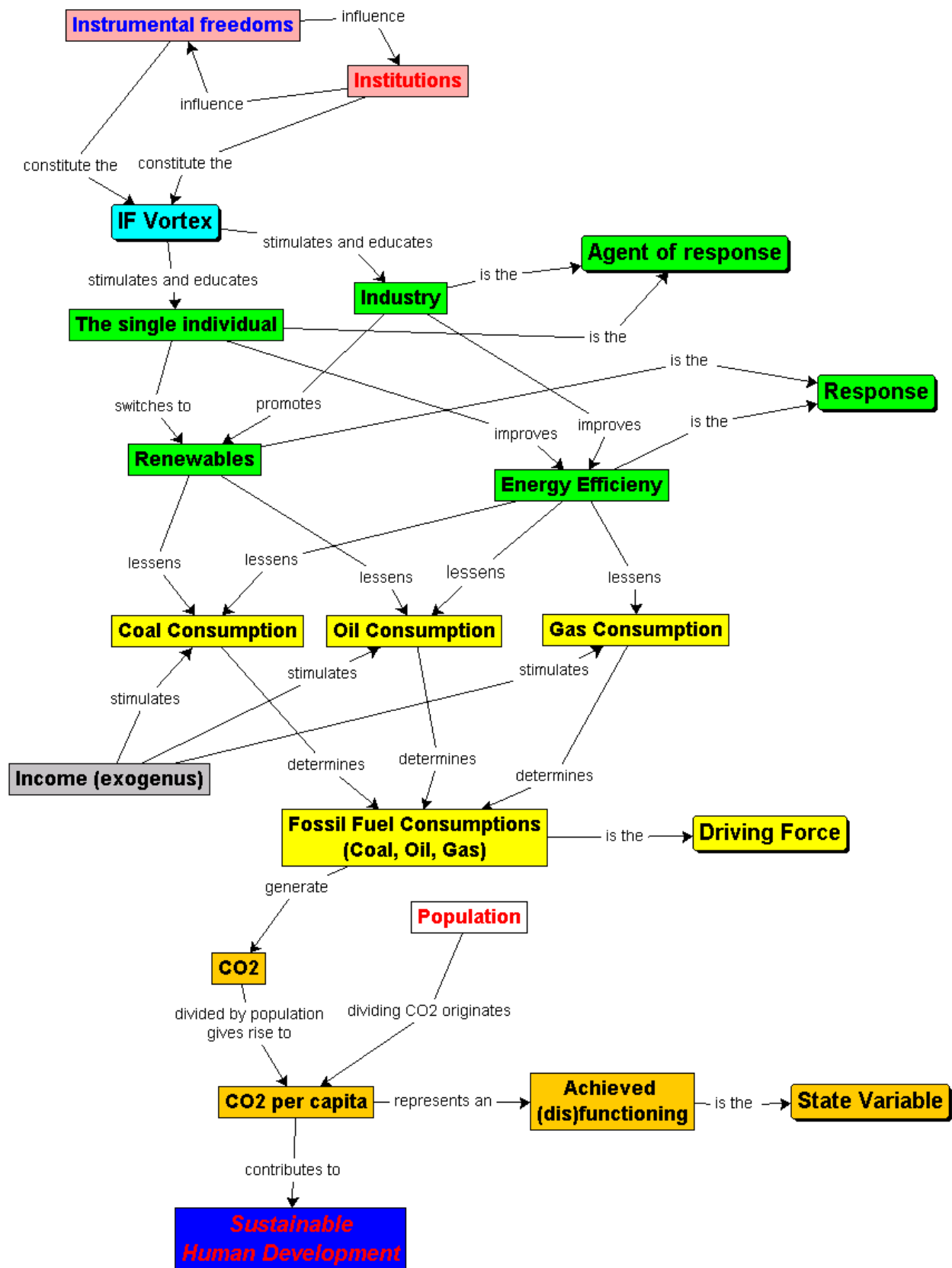
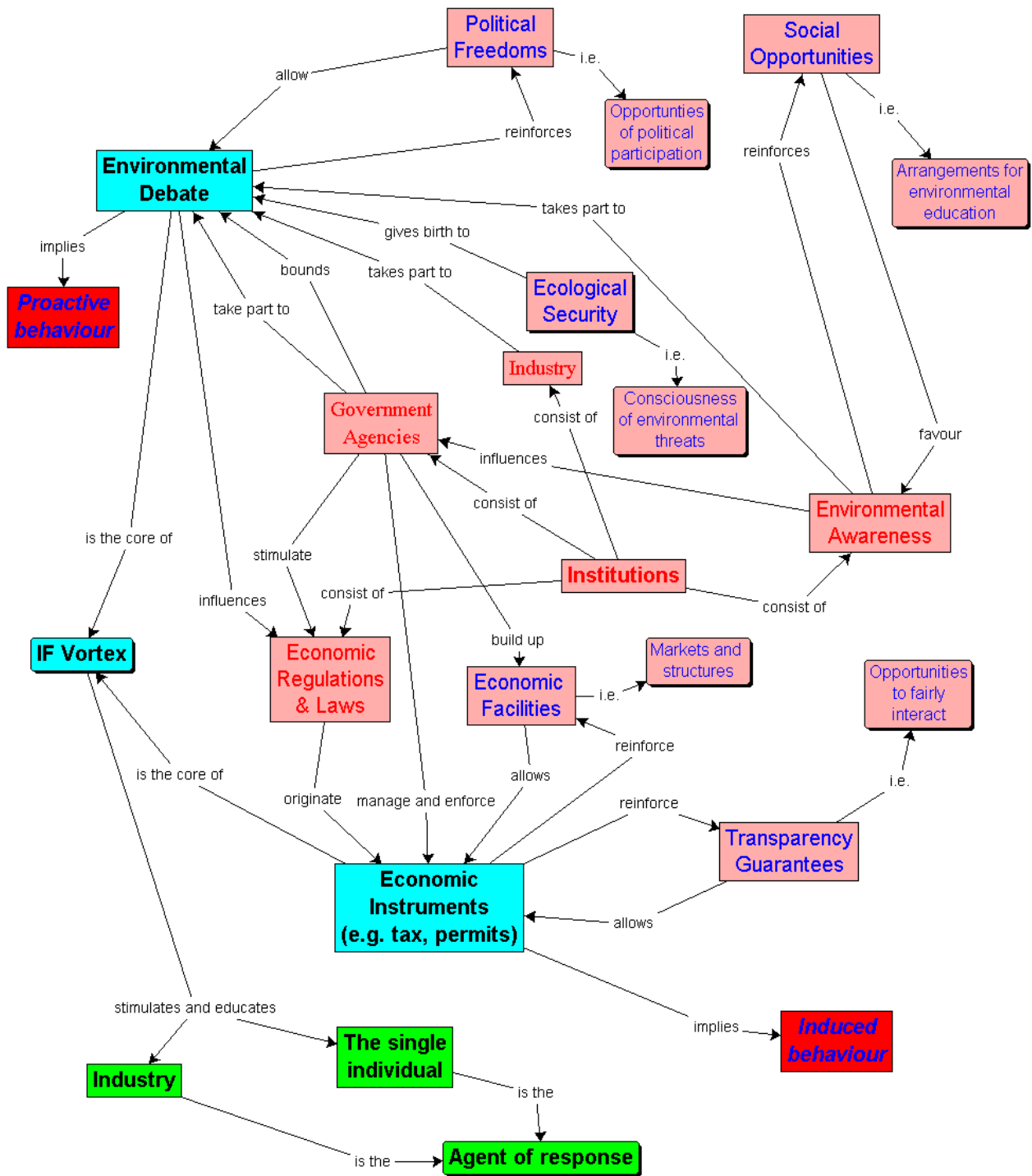


Figure 5 – CO₂ emissions: the IF Vortex map



The map depicts Institutions as a set composed of different elements, some of which are real agents (eg Government agencies and industry), while other ones represent a broader and less formal notion of institutions (eg environmental awareness, economic regulations and laws). With the exception of Economic Regulations and Laws, these institutions feed the Environmental Debate which is, in our view, one of the two cores of the IF vortex. Originated by Ecological Security (ie the awareness of environmental threats), the environmental debate is made possible by political freedoms. Without such freedoms the debate on CO₂ mitigation measures would not be possible. It is just this debate that influences economic regulations and laws which, in turn, originate policies and measures (eg carbon tax or tradable permits), that is the second core of the IF vortex. The two cores can be seen as actions and choices implying two different types of behaviour: the environmental debate arises

because of a proactive behaviour by institutions, while energy and environmental policies, originated by economic regulations and laws, imply an induced behaviour by the Agents of Response. Certainly, it is the need for environmental security aiming to oppose the effects of global warming that give birth to the environmental debate. Nevertheless, without a proactive behaviour by institutions, it would not be possible. It is worth stressing the role played by some relevant feedbacks: Environmental Awareness is favoured by Social Opportunities which, in turn, is reinforced by environmental awareness. Similarly, Political Freedoms allow the environmental debate and, at the same time, are reinforced by it, while Transparency Guarantees allow the use of economic instruments and are reinforced by them. Among institutions, a crucial role is played by Government Agencies. In our specific case, government agencies could coincide with the Ministry of Environment and institutions related to it (eg Environmental Protection Agency). Such agencies not only take part to the environmental debate, by stimulating and moderating it, but also build up those Economic Facilities which allow the functioning of the economic instruments. For instance, the Ministry of Environment, together with other ministries (eg Ministry of Industry), controls the supply and allocation of environmental permits and, at the same time, contributes to build up the market that makes possible their trading. In the end of the process there are the agents of response, namely the Single Individual and Industry. Their behaviour is influenced both by the environmental debate, to which they participate, and by the economic instruments implemented by Government agencies. It is worth stressing that only if we adopt a narrow view we can interpret agents' change in behaviour as the last ring of a sequential chain. Nonetheless this choice would be wrong, since the improvement in energy efficiency and expansion of low carbon content energy originated by the agent of response is the result of a complex and wide net of relationships: namely, the instrumental freedom (IF) vortex.

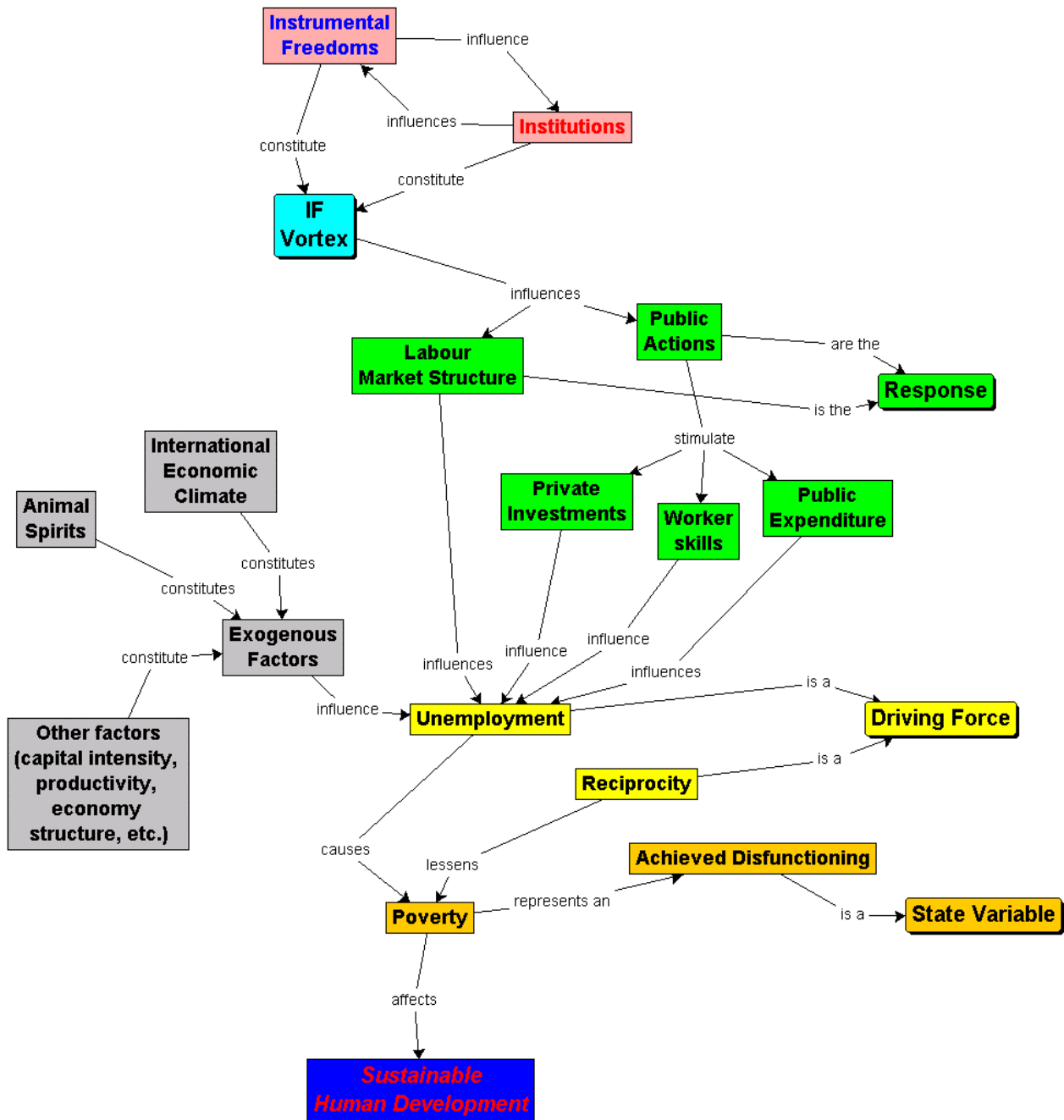
3.4 The economic building block

As an example for showing the IF Vortex in the economic sphere, we chose Poverty (Figure 6). While, nowadays, CO₂ emissions represent a variable affecting mainly energy and environmental policies of developed countries, poverty is a critical issue in developing countries and in some pockets of developed countries. As CO₂ emissions, poverty affects sustainable human development and is a state variable which represents an achieved disfunctioning, that is something that a society would like to reduce or eliminate. Driving forces of poverty are Unemployment and Reciprocity, the former being a cause of poverty, the latter being a poverty shock-absorber. Roughly speaking, reciprocity refers to the role played by families in sustaining the single individual in many periods of her life. According to Polanyi, socially obligatory gift-giving is the material expression of cohesive relationships and reciprocity is one of the three types of economic allocation process, the other two being market and redistribution. As agents of response we have Public Actions and Labour Market Structure. Public actions can be synthesised by policies that stimulate and favour the public expenditure (eg investment in public works), improvement of worker skills (eg through training) and private investments (eg through a discount rate reduction). Changes in labour market structure, for instance by introducing a high level of flexibility in job contracts, may be an incentive for employers and workers and, thus, favour employment. Naturally, unemployment is also influenced by many other factors that, due to the target of this paper, we will consider as exogenous. Among them, there are the so called "Animal Spirits" (ie people's attitude towards business), the international Economic Climate (whether or not the world economy is in good health), and a set of Other Factors such as capital intensity, labour and capital productivity, and the structure of the economy. Since they are not under the control of national institutions and cannot be seen as response levers, we will not focus on them.

A more precise description of the economic IF vortex is provided in Figure 7. We consider as institutions all those actors that play some role in the labour market debate: the Employers' Association, Governmental and Local Agencies, Political Parties, Labour Union. As a matter of fact, these are actors that stimulate, take part to and negotiate in a debate aiming at improving labour market conditions. Moreover, we included within institutions also the Monetary Authority and the wide set of Regulations and Law which affect labour market. Even if they do not take part to the debate they affect labour market in several ways. As in the case of CO₂ emissions, we stress the role played by Instrumental Freedoms. Firstly, the debate is made possible by the existence of political

freedoms which create and favour a democratic climate inside a country. Due to them, the new possible solutions inside labour market are more the effect of a game of proposal, discussion and bargaining among different actors, than the consequence of hierarchical decisions. Secondly, Labour Unions' action is informed by Protective Security. Thirdly, regulations and law are allowed by the existence of Transparency Guarantees. Two other cores of the IF vortex exist: one is Fiscal Policy, that is a set of taxation, incentive and public expenditure measures which, allowed by transparency guarantees and managed and enforced by government and local agencies, can push labour market towards a better functioning; the other one is Workers' Awareness, a consciousness' element which is strengthened by Labour Unions.

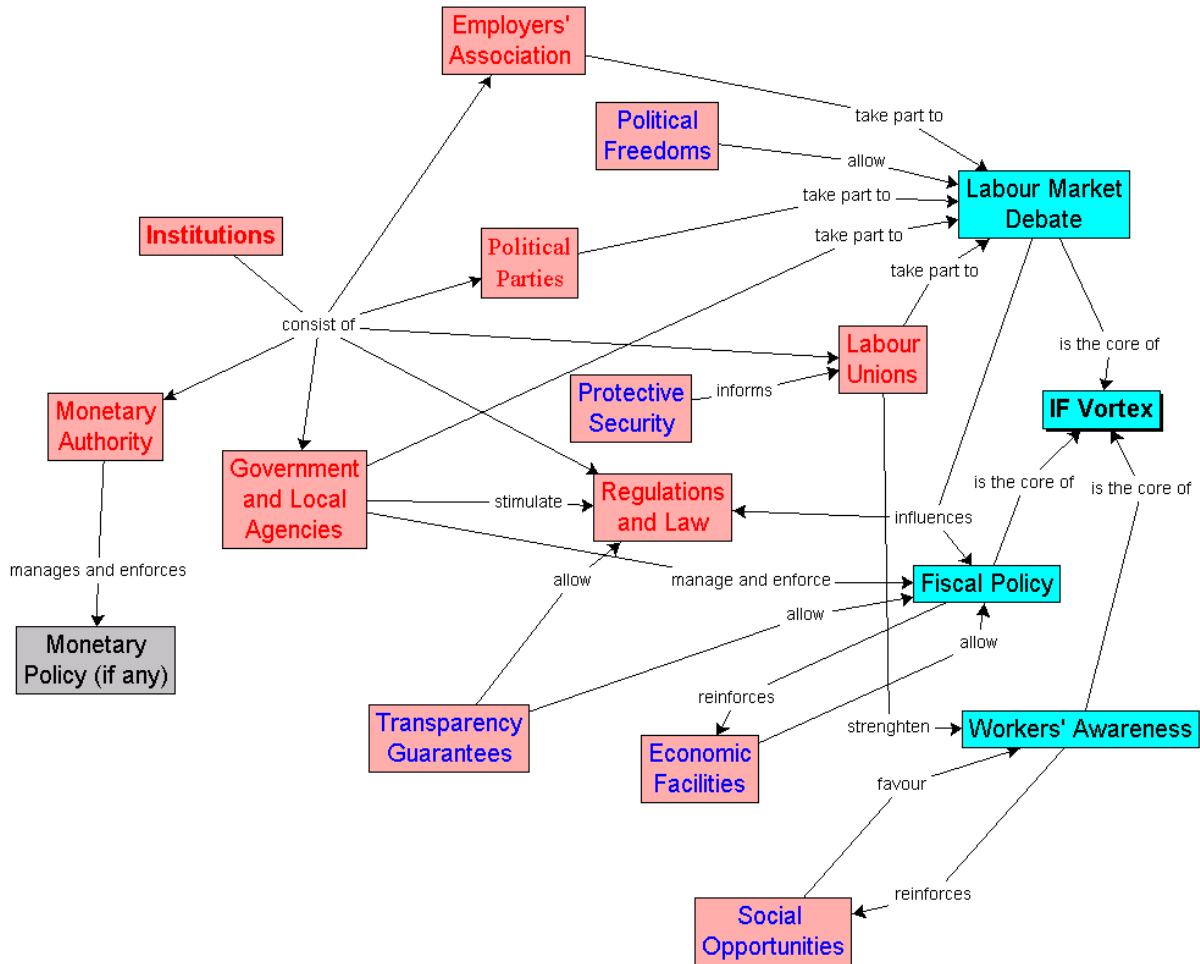
Figure 6 – Poverty: State variable, Driving forces and Responses map



Both Fiscal Policy and Workers' Awareness are related to some relevant instrumental freedoms. For instance, between Social Opportunities and workers' awareness there is a reinforcing loop, the former

favouring and being reinforced by the latter. Similarly, in a virtuous situation, Economic Facilities allow fiscal policy and are reinforced by it.

Figure 7 – Poverty: the IF Vortex map

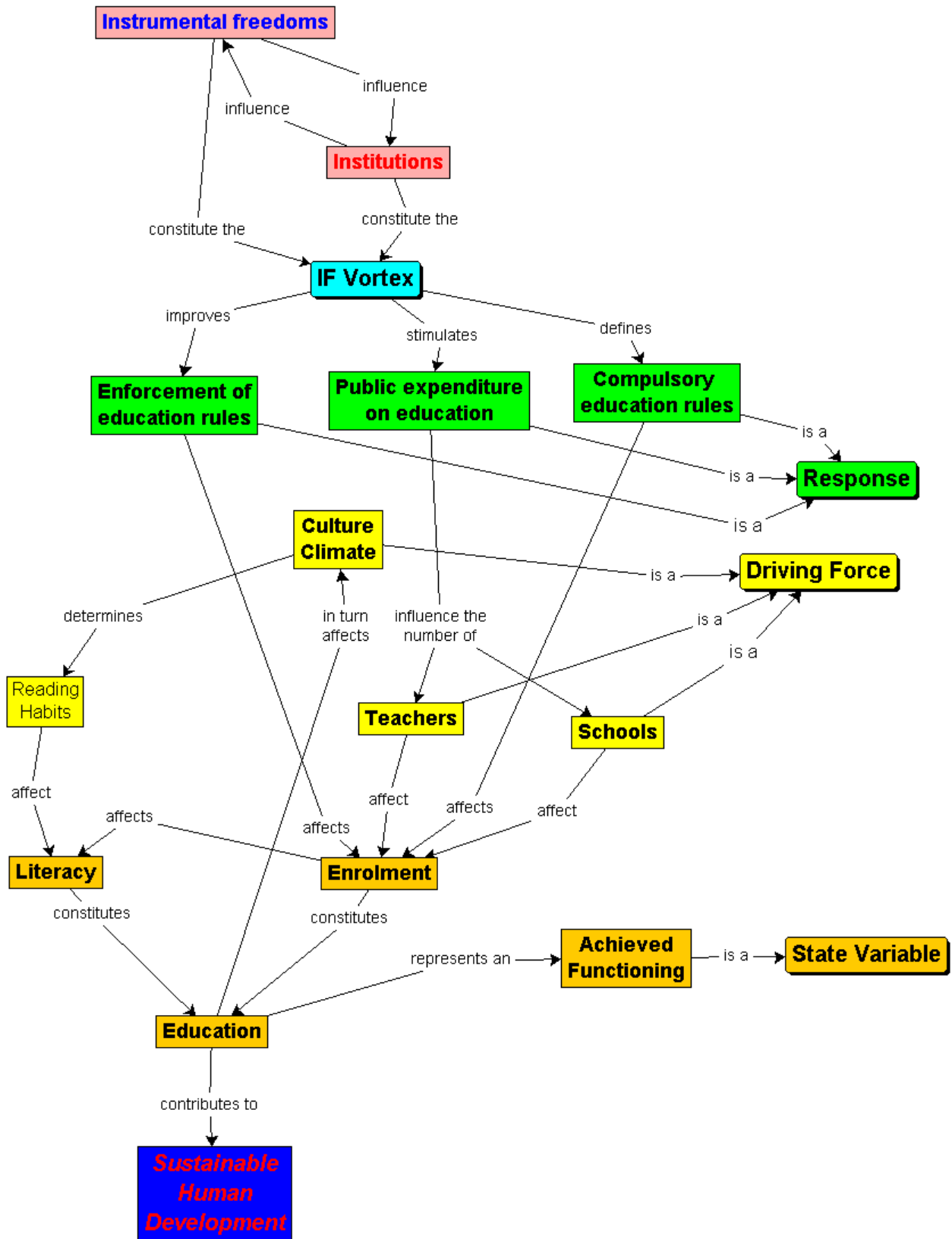


Naturally, the above map is only one of the possible descriptions of the IF vortex. Other perspectives could be proposed and explored. Here, beyond the exact - if any - formulation of the relationships net, it is worth stressing the fact that responses activated for the improvement of a certain situation (namely, unemployment and poverty) do not occur in a vacuum, rather they exist within a complex set of relationships which are made possible by instrumental freedoms.

3.5 The social building block

Our final example deals with the social dimension of sustainable development. Within it, we have chosen Education as an example of state variable (Figure 8). Education enters also the Human Development Index used by the UNDP since the beginning of the 90's. Education is composed of two variables: Literacy and Enrolment. The former is the reading and writing ability, while the latter refers to the years of enrolment in schools. The number of Teachers and Schools affects enrolment, the Reading Habits influence literacy and are determined by the general Culture Climate. Cultural climate, number of teachers and schools are the driving forces of education. As possible responses for improving the educational level we have individuated three variables: public expenditures on education, which directly influences the number of teachers and schools; compulsory education rule and their enforcement, which directly affects enrolment. While public expenditure is stimulated by the IF vortex, education rules as well their enforcement are defined and improved by the IF vortex.

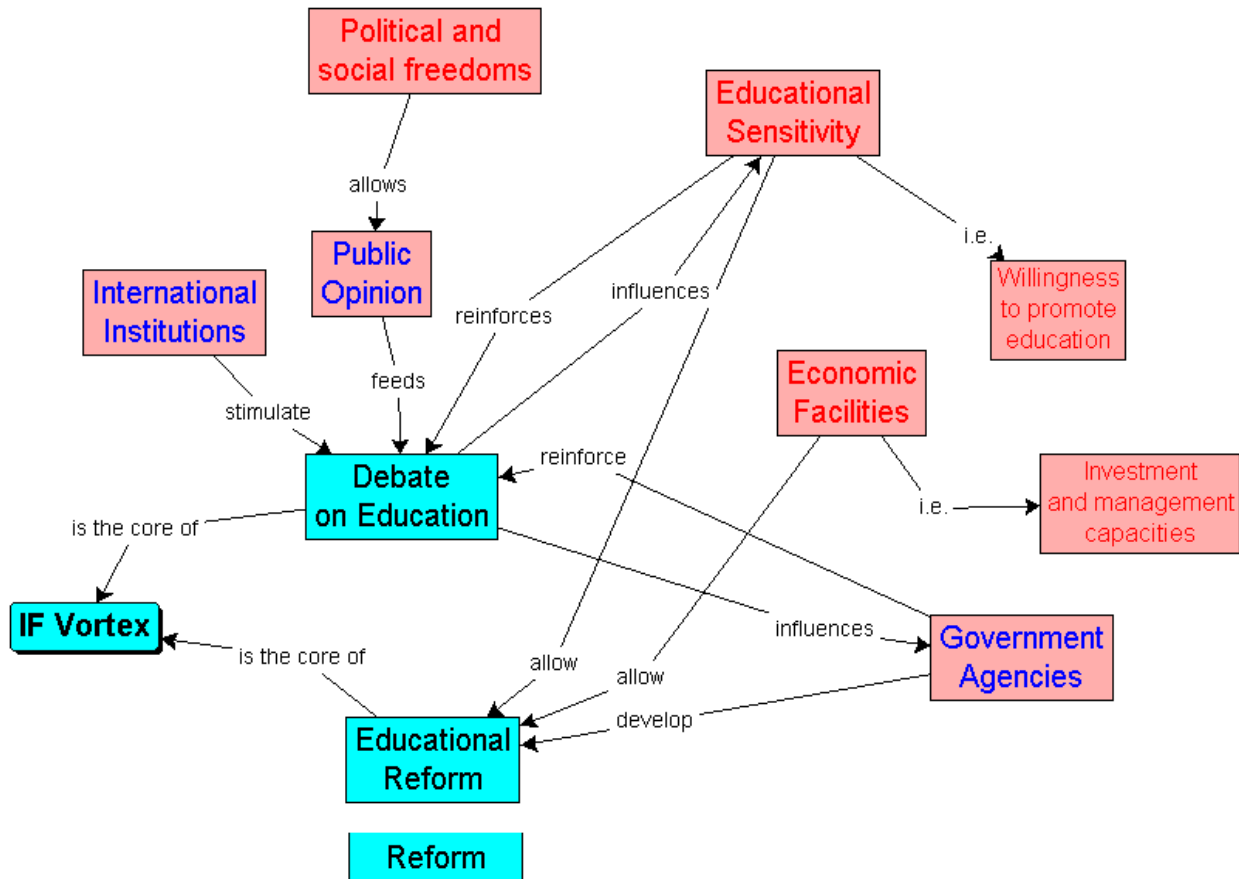
Figure 8 – Education: State variable, Driving forces and Responses map



Such a vortex is illustrated in Figure 9. It contains two cores: the Debate on Education and Educational Reform. As in the cases of CO₂ and poverty, a debate arises as a relevant element of the vortex. This fact has a quite intuitive origin, since we are talking about freedoms and, thus, about the

opportunity to express opinions and ideas, to participate through a negotiation to a change in some aspects of social life.

Figure 9 – Education: the IF Vortex map



This debate can be stimulated by several elements: in our map, we have drawn those ones we think are more important. Certainly, International Institutions can play an important role in shaping educational international standards, countries' situation and worthwhile improvements. On the other hand, inside each country, the need for an improvement in the standards of education can be stressed by the country's Educational Sensitivity and Government Agencies. Both these elements are related to the debate through reinforcing loops: Government agencies and educational sensitivity reinforce and, at the same time, are influenced by the debate on education. Indeed, Economic Facilities, that is the capacity of investing, organise and manage a reform project is an important basis for the educational reform.

Conclusions

The main purpose of this paper was to shape operative maps of sustainable human development based on Sen's capability approach. In its first part, we focused on some major theoretical issues of the capability approach and read the notion of sustainable development through the Senian lenses. A first step of our research consisted in turning theoretical concepts into empirical variables. Consequently we referred to the three-legged approach of HDI, by the Human Development Report Office, and the work of the United Nations Commission on Sustainable Development for identifying the three legs (environmental, economic and social). We also borrowed from this framework the distinction between State, Response and Driving Force variables.

Moreover, we depicted a complete reference map of Sen's capability approach in which all the main elements and relationships among them are synthetically systematised. This map represents a useful tool in moving within Sen's ideas.

Given such an approach we investigated each leg through real-world examples. In particular, the environmental sphere was studied through the case of CO₂ emissions; the economic one, focusing on poverty; the social one, referring to education. For each example, we provided two maps which thoroughly describe the role played by Institutions and Instrumental Freedoms in determining the space of chosen Constitutive Freedoms. We think that our detailed pictures, referred to specific examples, represent a point of strength insofar they can be considered worthwhile paths to a complete operationalization of Sen's approach.

However, we pushed our analysis to the level of empirical variables, even if we did not provide quantitative indicators and functional relationships between variables. The main reason for that was the difficulty in finding reliable data. We believe that such problem could be overcome by building a database specifically tailored for the capability approach.

We consider our proposed framework consistent with Sen's view of sustainable development, in which commodities are only the material basis. In fact, human development depends greatly on institutional efficiency and effectiveness and their relationships with instrumental freedoms: as we did, these elements can be usefully mapped in systemic models.

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