

Social Footprint: taking time to measure social impact

Professor Adrian Henriques, Middlesex University

e-mail: adrian@henriques.co.uk

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Abstract

This paper discusses the difficulties of identifying sustainability at the level of the individual company and identifies the need for a broad indicator of social impact. It proposes a way of understanding social impacts in terms of a 'social footprint'. This has many parallels with the established concept of an ecological footprint, which does have limitations, but is an elegant and effective indicator. Whereas the central focus of an ecological footprint is space; it is proposed that for a social footprint, the central focus should be time. Alternative bases for a social footprint measure, including the Human Development Index are considered, but it is concluded that they cannot provide as effective an indicator. The concept of a social footprint is defined and examples of how the calculation of a social footprint may be approached are set out, with particular reference to companies. The relationship of footprint indicators to sustainability is also discussed.

From Sustainability to Impact

During the second half of the twentieth century there has been increasing discussion and analysis of sustainability within the academic community. Given the growing role of business within human activity, there has also been discussion of ways to measure business' contribution to sustainability. Dyllick and Hockerts (Dyllick and Hockerts 2002), in summarizing the many contributions to this debate, have argued in this connection that:

- companies should be sustainable
- sustainability for a company can be defined in terms of the depletion, caused by that company, of three types of capital: economic, ecological and social.

They develop their theme by pointing out that for each of these capitals, there are limits to what the global system can bear. It follows that it is insufficient to focus only on the efficiency with which these capitals are used and a more sophisticated analysis of sustainability is required.

While their argument is persuasive, there is an important difficulty with this approach concerning how it can appropriately be applied at the level of an individual company. This manifests itself in two ways. Firstly, at a theoretical level, sustainability is a property of the global system as a whole, rather than of the individual elements which make it up. This can be seen through considering the example of a manufacturing company which produces a carbon-saving technology through a carbon-intensive process. It is quite feasible that the company's products might save far more carbon emissions when in use by other companies than are produced in their manufacture. Yet it would be counter-intuitive to say that the manufacturing company was inherently unsustainable. In general, whether or not global system limits are breached cannot be determined by considering the activity of any element of the system in isolation.

Secondly, at a practical level, if a company is to manage its sustainability contribution, it must measure and account for it. Therefore a coherent system of accounting needs to be developed for the ecological and social dimensions of sustainability. Some work has been undertaken to do this in relation to income accounting (Bent 2005), but very little on true capital accounting. One particular difficulty with such a sustainability capital accounting is that, unlike the global level at which capital is an asset, at the level of the individual company capital is a liability which is owned and therefore (in the logic of the market) priced by another party – which is the immediate motive to account for it. Of course, only very recently have mechanisms been introduced to price carbon emissions; the great majority of ecological factors involved in sustainability remain almost wholly un-priced. The pricing of social factors is perhaps even more problematic, as it would seem to require the commercialisation of a whole range of human experience which has hitherto been largely outside the marketplace. The pricing of some forms of intellectual property, to take just one example, is still a very controversial issue.

In the light of these issues, what is an individual company to do if it sincerely wishes to manage its contribution to sustainability? In practice, this must include attempting to identify, evaluate and report on a variety of indicators. This paper will focus on how a practical approach to social indicators for sustainability can be developed. It is argued that one of the main barriers to effective measurement of social impact is the multiplicity of social impacts, and therefore indicators, required. It is proposed that a social footprint indicator can be developed, on the analogy of the ecological footprint, which will provide a measure of the overall scale of social impact. This would, at least, enable attention to be better focussed upon those organisations and activities which on account of their social impact require more detailed analysis and measurement.

Social Indicators for Organisations

Much work on social indicators to date, for example in the aid and development literature, has concentrated, quite rightly, on those groups which bear the impact and on their point of view. However it is also useful to be able to relate social impacts to the social institutions which give rise to them. This is true of organisations in general and of companies or private corporations in particular, given their tremendous size and influence in the world today.

Such work as has been undertaken on corporate impacts has tended to suggest that a multiplicity of indicators is necessary to capture their social and ecological impacts. The work of Wood and Hopkins (Hopkins 1998; Wood 1991), for example, is of this nature. The advantages of this approach centre on its ability to reflect the apparent diversity of social impacts caused by any one organisation. However the disadvantage is that comparison between organisations becomes far more complicated.

In recent years, the practice of CSR, or ‘corporate social responsibility’, has become widely publicised, if not so widely practiced, within the business community. It has become widely accepted that a part of CSR is the publication by an organisation of reports of its environmental, economic and social impacts. However not only have the structure and scope of these reports varied very widely, but there has been little which any two such reports have in common in relation to the indicators, if any, that are reported. The Global Reporting Initiative (GRI) was established to address this situation and to establish common standards and shared indicators for reporting of sustainability impacts, including its economic, environmental and social dimensions. However this initiative has also suggested that a considerable number of social indicators is required (GRI 2002).

In general, it appears to have been harder for companies to report on social impacts than on environmental impacts, see (Adams 1999). Corporate social reporting has trailed corporate environmental reporting, partly due to the lack of suitable indicators. In particular, there is no

overall indicator which readily captures the scale of a company's social impact. With this in mind, the question of whether it is possible to find some overall indicator of organisational social impact arises. In relation to ecological impact, this problem has been addressed through the development of the 'ecological footprint', described below. The question for this paper is whether it is possible to define and measure an analogous indicator, the 'social footprint' which may be useful to gauge the social impact of companies and other social entities.

Learning from the Ecological Footprint

The idea of an ecological footprint was derived from that of carrying capacity. The concept of carrying capacity was developed to define the maximum biological population, and its resulting biological load, which a given area of land might continuously support. It is intended to be a significant measure related to sustainability and is typically measured as a population level per unit area, which can be supported by the land. A footprint approach reverses this ratio to consider the quantity of land which a given population requires. The concept of 'ecological footprint' for a population was defined by Mathis Wackernagel and William Rees (Wackernagel and Rees 1996) as:

“the area of ecologically productive land (and water) in various classes – cropland, pasture, forests, etc – that would be required on a continuous basis:

- a) To provide all the energy/material resources consumed, and
- b) To absorb all the wastes discharged

by that population with prevailing technology, *wherever on Earth that land is located.*” (Wackernagel and Rees 1996, p51-52).

Much work has taken place in applying and using the concept to assess overall ecological impact in practical ways. It has been applied to regions, cities, organisations (Lenzen et al. 2003) and to products. The concept of the ecological footprint remains extremely compelling because it provides indicators which appear to be obviously related to overall sustainability through the interactions of the demands of different ecological processes. What the ecological footprint captures is the *command over land*, or ecological resources, of the population concerned.

It is important to appreciate, however, that the concept of the ecological footprint is not generally claimed to be an indicator of *sustainability* itself, at least directly. As a quantity of land needed by a given population, it captures the contribution to overall ecological load exerted by that population. As a comparative measure of different populations it can also reflect the relative intensity of such ecological demand. The principal reason why such a measure cannot be a direct measure of sustainability, is that sustainability is a property of a system as a whole, rather than of any given entity within that system. Knowledge of the system as a whole may suggest certain limits which should not be breached, thus giving rise to 'sustainability indicators', see for example (Smith and Zhang 2004; Meadows, Randers, and Meadows 2005). One important consequence of this is that a large ecological footprint, strictly speaking, does not *on its own* somehow imply unsustainability.

As a practical indicator the ecological footprint has a number of important characteristics, which may be regarded as tests for effective footprint indicators. These 'footprint conditions' are that the proposed footprint is:

1. possible to calculate to a reasonable degree of approximation
2. related unambiguously to impact; for the ecological footprint, an increase in a footprint will imply an increasing command over ecological resources
3. able to provide comparisons between different applications; through the ecological footprint, the ecological impacts of different populations have been applied to a wide variety of 'populations', including countries, cities, organisations and products.

It is important to emphasize the crucial role which land (or more generically, perhaps, space) plays in the formulation of an ecological footprint. The role of land is that so many, if not all, ecological processes are mediated through it. In Wackernagel and Rees' words, "Land area not only captures the Earth's finiteness, it can also be seen as a proxy for numerous essential life-support functions from gas exchange to nutrient recycling." (Wackernagel and Rees 1996, p56).

The ecological footprint has its challenges. From a practical perspective, the calculation of a specific footprint is not a trivial task; in particular only direct land requirements have usually been calculated, the land requirement for the production of capital inputs has often been ignored. Some of the other practical problems include the assumptions concerning the sustainability of the land required for uses such as agriculture and the most appropriate way to include the requirements for sea and air.

There are also inherent limitations to an indicator which so highly aggregates information from a wide variety of ecological processes, however legitimately. Nevertheless land is the central aspect of an ecological footprint and this serves to reflect, systematically (Holmberg et al. 1999), humanity's impacts on the environment. Of course an ecological footprint, being a single indicator, does not separately reflect the different contributions arising from the various factors influencing it. In this sense it cannot capture all aspects of environmental impact. Neither can it dictate how the requirement for a quantity of land, should be achieved (Lenzen and Murray 2003). It has in effect been criticised for what it does not do.

Of course in recent years the proposition that sustainable development is only ecological (or environmental) in nature has been questioned and the idea that it involves more than just an ecological dimension has become widely accepted. Similarly for companies, the idea of the 'triple bottom line' (Elkington 1998; Henriques and Richardson 2004) makes explicit the idea that the contribution to sustainability of an organisation involves at least a social as well as an environmental dimension. Yet there is no indicator equivalent to the ecological footprint for social impact. The following sections of this paper propose how such an indicator, sharing similar characteristics to those identified above for the ecological footprint, can be derived.

A Social Footprint in the footsteps of the Ecological Footprint?

The point has often been made that social systems (and within them economic systems) are merely aspects of ecological systems; without a natural world there can be no society, whereas the reverse does not hold. Much of the practical work on 'sustainable development' has been on specific impacts and their relationship to ecological changes resulting from particular economic development projects, see for example (WB 2003). So if social impact is an important component of sustainability, perhaps the concept of an ecological footprint can be extended to include social aspects, rather than developing a measure of the social aspects as a separate indicator, the social footprint.

Adding weight to this perspective, social and environmental issues are interconnected. Social issues relate to ecological issues in two key ways:

1. social well-being is required if adverse environmental impacts are to be allocated sufficient resources and systematically addressed
2. adverse environmental impacts can form an important component of social issues. In both developed and less developed societies, environmental impacts such as pollution or the availability of natural resources are socially skewed.

Possible candidates for integration into such an expanded footprint might include some sort of derivative of the UNDP's Human Development Index¹ or some measure of social equity. Each of these measures appears to capture the extent to which a population has achieved important social outcomes. They are also calculable, and so satisfy the first condition for footprint indicators identified above.

The Human Development Index is in fact a 'composite index' or assembly of heterogeneous measures (including literacy and life expectancy, for example). As a result, the relationship, or more precisely the linearity of the relationship, with social sustainability may not be clear. It is possible for different countries to achieve the same index score for entirely different reasons (as might be argued for their ecological footprints). It is therefore difficult to draw detailed lessons from comparisons between two such countries with the same index score.

Social equity on the other hand can be calculated as a homogeneous measure. It may be assessed through measuring access to resources, ie social and environmental goods, and exposure to social and environmental 'bads', see (McLaren et al. 1998) for example. Income distribution, for example, can provide a measure directly reflecting one aspect of social equity and, it could be argued, also a proxy measure for other aspects of social equity. It could therefore appear to make sense that social equity might be a candidate for integrating with an ecological footprint. In practice, this might be achieved by in some way weighting an ecological footprint with an indicator of social equity, such as the distribution of income for the relevant population.

While it may be possible to calculate, the major problem with integrating social issues into a broader indicator is that it will exacerbate the aggregation of information, which as we have seen is already an issue with the ecological footprint. This is another aspect of the debate concerning weak and strong forms of sustainability, which hinges on whether an adverse impact of one kind may be 'made up' by positive impacts of another kind. In other words, is it valid to trade off improved social equity, say, for environmental degradation and still have an acceptable outcome? This paper will not attempt to resolve this issue; it will be sufficient to point out that to integrate a social footprint indicator into a 'larger' indicator will inevitably presuppose that such trading off is permissible. Conversely, should such trading off be viewed as justified, then a separately developed social footprint indicator could still provide the means to do that as a separate exercise.

It can be concluded that while it may be possible to develop such a footprint indicator combining ecological and social measures, it is not clear whether it would unambiguously indicate the scale of impact. It would therefore meet the first, but not the second or third of the footprint conditions outlined above.

If the Human Development Index, or some measure of social equity, are not to be used as part of an enhanced ecological footprint indicator, could either of them be used on their own to form a social footprint indicator? This is problematic as each of these measures are 'outcome measures', capturing what is desirable for society. However the sources or origins of these outcomes are not directly captured. It is therefore difficult to apportion the outcomes to anything less than large populations, typically at a national level. As social footprint indicators, they would be relatively inflexible – at least in comparison to the ecological footprint.

Space, Time and the Social Footprint

The Human Development Index and social equity measures both lack a single factor which is in turn closely connected to the multiple aspects of social impact. For ecological footprints

¹ See the UNDP website for details: <http://hdr.undp.org/statistics/>

there is such a factor: land, or space, more generically. The most immediate difficulty for a social footprint is that social processes are not so closely bound up with land - although of course land may often have tremendous social significance.

Is some other factor available? At first sight, the idea seems fraught with problems. The nature of social impacts seems to have so many qualitatively different aspects - consider status and esteem, social networks and the density of relationships or wealth and its distribution, for example. How could a single indicator capture all of that? Of course, as noted above, a single number cannot integrate the measures of many different variables and at the same time reflect the contribution of each of them. However this is not what the ecological footprint does either (in relation to ecological impacts). The ecological footprint takes advantage of the relationship of one factor to the many different kinds of ecological impact. The final footprint measure only includes in a derivative sense the vastly different kinds of ecological consequences of human behaviour. It captures the central dependency of all the different kinds of ecological impact on a single resource. It may be possible to find a corresponding factor with the same function in relation to social impacts.

It is proposed that the corresponding factor for social impact is *time*. Time can be regarded as central to social processes in the way land can be regarded as central to ecological processes. Time can serve a parallel function for an indicator of social impact to that of land for environmental impact. The use of time as the basis for the indicator also captures the essential human commitment to a social relationship far better than can an indicator based, for example, on market relationships.

Why is time so central to social process? At a theoretical level, time is an essential element of social process. As Anthony Giddens has pointed out, social structures and institutions are only manifested across time. "The study of day-to-day life is integral to analysis of the reproduction of institutionalized practices. Day-to-day life is bound up with the repetitive character of reversible time - with paths traced through time-space and associated with the constraining and enabling features of the body." (Giddens 1984)

On a more intuitive level, time may be felt to be important to critical social issues such as the practical expression of human rights. For example the right to freedom from slavery is essentially a right to enjoy one's own personal time. It may be possible to articulate other human rights in this way, as the 'availability' of a person to themselves.

This is not to forget that there are a number of senses in which time is related to social and ecological processes in very straightforward ways. Time is factored into the ecological footprint through the rate at which physical processes occur and therefore affects the quantity of land needed to provide the environmental services required by a population. Time is also required for social processes in this sense. And in the trivial sense that any process will occupy space to some degree, space is also required for social processes.

The Footprints of Robinson Crusoe

If time is to form the core of a social footprint indicator, how can the time relevant to social processes be measured in a practical way? Robinson Crusoe, a story written by Daniel Defoe, provides a helpful starting point to illustrate how the concept of a social footprint might work in practice. Robinson Crusoe was shipwrecked and marooned on an island. He had some supplies, including a gun, but he had to fend for himself. At first he thought he was alone, but then discovered that there was another human on the island, whom he named 'Man Friday'. Had Man Friday not emerged, Robinson Crusoe may not have needed more land than he had: we can assume that his footprint was no more than that of the island together with some of its local waters.

At this stage also, socially, although he was most certainly lonely, his day to day activities filled his time and provided everything he needed (or at least all he got). He also had 24 hours in a day and provided for himself in that time. We can define his social footprint as the 24 hours (or more precisely, 'person-hours' per day), that he had available.

When Man Friday emerged, the human ecological load on the island would have been recalculated as about double that of Robinson Crusoe alone. However, assuming they both could have survived indefinitely, their total ecological footprint would still have been less than that of the island.

However when Man Friday arrived, Robinson Crusoe and he entered into a social relationship. In the story, Robinson Crusoe becomes Man Friday's master. What this meant in practice was that some of Man Friday's time was devoted to Robinson Crusoe's interests and commanded by him. If we assume that half of Man Friday's time was devoted to Robinson Crusoe, then the time Robinson Crusoe will have available to himself is greater. His social footprint is now 36 hours per day.

What this captures is the extent to which Man Friday's time was not his own, reflecting his subservience to Robinson Crusoe. A social footprint thus adequately captures Robinson Crusoe's command over the time of others. Of course, this should not be taken to imply that the only socially acceptable solution is complete individual autonomy. Robinson Crusoe might specialise in fishing and Man Friday in gathering fruit. If each shared the results of their work with the other, their social footprints might each remain at 24 hours per day.

Social Footprint and Embodied Labour

The time reflected in a social footprint is related to the notion of 'embodied labour' as developed in Marxian theories. Marx (Marx 1974) was concerned to relate the product prices and profits achieved by the owners of capital to the quantity of labour expended in their production. This quantity of labour has been termed embodied labour; it is further divided into the direct (labour) time embodied in the production of commodities and the indirect time embodied in the production of the capital goods used to manufacture those commodities. Marx' purpose was to show that those who expended the labour deserved its fruits.

However, while the social footprint indicator might include embodied labour in its calculation, its purpose is not to analyse the distribution of profits, but of time. Its use would not therefore run into the 'transformation problem' of finding the function which converts time to price and thereby profit. The social footprint indicator might nevertheless make use of the distinction between direct and indirect time in calculating social footprints.

More broadly, a social footprint as measured by time and the corresponding embodied labour are also different because:

- the social footprint calculation need not be confined to the time involved in economic production. Just as relevant to certain social footprints may be the time devoted to maintaining a household and to leisure
- the time involved in a social footprint of an economic production process will not, in general, be contributed by employees alone, as will be shown below. A social footprint for a production process, however, might be said to measure total embodied time.

Whose footprint? Whose time?

Having established the principles of the calculation of social footprint with the Robinson Crusoe example, how would a modern, real world example look? There are perhaps two key questions: whose footprint is to be calculated and whose time should be taken into account?

The ecological footprint defines a boundary for the population whose footprint is to be established. The boundary is typically, but not invariably, delineated by a spatial limit – this may be a city or a country, for example. For a social footprint, it would seem appropriate to use a social institution to define the boundary of the ‘population’. In a sociological sense, an institution is a series of processes replicated over time.

How could the social footprint of a retail company, for example, be calculated? The social footprint of a retail company should reflect the time invested in that company by all its stakeholders. That would include, for example:

- the time expended by suppliers in making and delivering the products it sells
- the time spent by managers and staff in devising promotions, stocking shelves and other activities (the embodied direct labour)
- the time spent by customers in purchasing its products
- the time expended by company analysts in making recommendations to shareholders.

To make the outline calculation simpler, we can assume that the retail company’s only stakeholders are farmers supplying apples. The social footprint may then be calculated as follows:

1. for supplier-a obtain the total number of hours expended over a year on:
 - a. the planting and care of the apple trees
 - b. the harvesting of the apples
 - c. the arrangement of transport to the retailer
 - d. an apportionment of time spent on capital works, eg maintaining fences
2. divide the total hours per year by 365 to give the average daily time commitment related to supplier-a
3. repeat steps 1 and 2 for each supplier
4. add all the supplier footprints together to obtain the retailer’s social footprint.

To take into account other stakeholders, the social footprint would then need to be summed across all its stakeholders and expressed as stakeholder-hours per hour. In other words the social footprint will capture the time invested in an organisation each day.

In calculating actual social footprints, it is important to bear in mind the effects of different production methods will mean that a footprint is not necessarily directly proportional to corresponding economic output. One of the consequences of including embodied labour within the footprint calculation is that the time expended in production is dependent on the level of technology employed in the production process. Higher technology generally enables greater rates of productivity. Other things being equal, this will tend to lower the social footprint. This reflects the fact that the corresponding social relationships will be altered by a given new technology.

Of course, just as with the calculation of an ecological footprint, there are questions for the social footprint about where the boundary of the time to be included should be drawn. Should all the labour required to produce all the capital goods be counted in the embodied labour, for example? And practically, it will of course be onerous to calculate the total embodied labour within all the capital goods involved in the production of even an apple, considering all the capital equipment involved, from conveyor belts to integrated circuit board manufacturing equipment for tractors.

Footprinting Sustainability

Finally, it may be useful to clarify the relationship of footprint indicators to sustainability (considered as a system-level concept) rather than their relationship to impact. While it may not be practical to calculate in any detail the ecological footprint for the world’s total population, if it were found to be greater than the total available land, then there is clearly a

condition of absolute ecological unsustainability. This might occur should the entire global population attempt to live at the same level of material well-being that the Western world currently enjoys. Should the global footprint in this situation, be greater than the available land, this would of course not mean that more land had somehow been created, but that natural capital was being depleted at a greater *rate* than it was being created.

There are two reasons why a smaller ecological footprint is thought to be more sustainable than a larger one. The first is that the world is shared; so it is more likely to be possible for all populations to co-exist with each other (including non-human ones) if any given human footprint is reduced. The second is that it is assumed that ecological resources are produced, to a first level of approximation, through the natural workings of ecological systems and without a human contribution. In other words the assumption is that a human population only draws upon external ecological resources; it does not contribute to them. On this assumption, it follows that a larger footprint is always 'worse' than a smaller footprint, since it uses more such resources. However it may be observed that it is not entirely true that all ecological impacts of humans have to be negative; some of the uses to which humans put land (and even the activities of ecological footprinters) might be regarded as positive.

I believe that it is possible that a parallel condition of global unsustainability might prevail for social reasons. In a situation in which the global population ceased to undertake productive work at all, we would encounter social unsustainability. It is possible, over a short period, for human activity and consumption to command more embodied time than is being produced over that period. In that situation, human consumption would be drawing on social resources at a greater *rate* than they were being created. In terms of time, this would mean that the global social footprint was greater than 24 hours per day. Of course, it is not possible to sustain this situation for a very extended period; it is socially unsustainable.

Are there reasons to think a smaller social footprint is also more sustainable than a larger one? Given that social resources (just as ecological resources) must be shared, it would follow that there will at least be some pressure for larger social footprints to be reduced, otherwise conflicts for resources will result. However social footprints differ from ecological footprints because social resources are produced by the human population itself, not by external systems. This includes, for example, positive social resources, such as knowledge and learning. So while a larger social footprint will reveal a larger command of time, it may also permit a greater rate of consumption of social resources. Under some circumstances this may therefore enable a society to exist for a longer time in a situation in which social resources were being consumed, unsustainably, faster than they were being produced.

Conclusion

Does a social footprint indicator satisfy the three practical footprint conditions? It is, in relation to the first condition, clearly possible to calculate. In relation to the second condition, it appears clear that the social footprint of an organisation will increase with the command of the population or organisation over the time of others. The scale of its social impact, which will be composed of a variety of different social effects, will also increase as a result. However the correspondence of a larger social footprint with a greater degree of unsustainability is weaker than for ecological footprints. In relation to the third condition, it is possible to calculate a social footprint for various different 'populations' or organisations. A social footprint, therefore, should satisfy the three conditions for a footprint indicator identified above.

How far are social footprint calculations of interest? In answering this question, it should be borne in mind that an ecological footprint in itself has no intrinsic interest. For example, the average Canadian's footprint has been calculated at 4.7 hectares. *On its own* this says nothing about the sustainability of Canadians. Yet the ecological footprint becomes very interesting

when used to compare the footprints of peoples in different places. So while not actually measuring sustainability, an ecological footprint leads to greater insight into the way ecological resources are *allocated*. This allocation is extremely relevant to the practical achievement of sustainability.

Similarly, a social footprint figure becomes interesting when used to compare how time is allocated between organisations. In addition, social footprint calculations can be used to compare how time is allocated between different stakeholder groups of the same organisation. Where such social imbalances are significant, they are likely to decrease social sustainability. This kind of analysis may be done at a number of different levels and should give an insight into power relationships as expressed by how far the time of one group is commanded by another. Examples of such analyses which could form the subject of future research include:

- considering a national social footprint, how does the time commanded by different imports compare to the relative costs of those imports?
- how is an organisation's management time allocated between stakeholder groups? Is this proportionate to the stakeholder time devoted to the organisation?
- considering a personal social footprint, is it bigger than 24 hours? This would mean that the individual has a disproportionate quantity of time at their command. (As was the case in one of the Robinson Crusoe scenarios considered above.)

It is unlikely that any indicator can capture all aspects of either ecological or of social impact. Nevertheless, it is very useful to have high-level indicators which are systematically related to the scale of ecological impact on the one hand and to the scale of social impact on the other. The concept of social footprint explored here is an attempt to provide that indicator for social impact.

This paper has shown that a social footprint may be defined for a given institution over a certain period as the time expended by the stakeholders of that institution in supporting it over that period. The calculation may be applied not only to companies but also to individuals, groups of individuals and to public organisations and to specific products. There are three important conditions for footprint indicators that are satisfied by a social footprint indicator based upon the idea that time is the foundation for measuring overall social impact.

References

- Adams, C.A. 1999. *The Nature and Processes of Corporate Reporting on Ethical Issues*. London: (CIMA)
- Bent, D. 2005. Towards a Monetised Triple Bottom Line for an alcohol producer. *Environmental Management Accounting Network (EMAN) proceedings* (Sustainability Accounting and Reporting).
- Dyllick, T, and K Hockerts. 2002. Beyond the Business Case for Corporate Sustainability. *Business Strategy and the Environment* 11:130-141.
- Elkington, John. 1998. *Cannibals with forks : the triple bottom line of 21st century business, Conscientious commerce*. Gabriola Island, BC, Stony Creek, CT: (New Society Publishers)
- Giddens, Anthony. 1984. *The Constitution of Society: Outline of the Theory of Structuration*. Cambridge: (Polity Press)
- GRI. 2002. Sustainability Reporting Guidelines. (Boston, Amsterdam: Global Reporting Initiative)
- Henriques, Adrian, and Julie Richardson, eds. 2004. *The Triple Bottom Line - does it all add up?* (London: Earthscan)
- Holmberg, J, U Lundqvist, K-H Robèrt, and M Wackernagel. 1999. The Ecological Footprint from a Systems Perspective of Sustainability. *International Journal of Sustainable Development and World Ecology* 6:17-33.

- Hopkins, Michael. 1998. *The Planetary Bargain: Corporate Social Responsibility Comes of Age*. London: (Macmillan)
- Lenzen, M, S Lundie, G Bransgrove, L Charet, and F Sack. 2003. Assessing the Ecological Footprint of a Large Metropolitan Water Supplier: Lessons for Water Management and Planning towards Sustainability. *Journal of Environmental Planning and Management* 46 (1):113-141.
- Lenzen, M, and S Murray. 2003. *The Ecological Footprint – Issues and Trends*: University of Sydney)
- Marx, K. 1974. *Capital*. Vol. 1. London: (Lawrence & Wishart)
- McLaren, Duncan, Simon Bullock, Nusrat Yousuf, Earthscan., and Friends of the Earth. 1998. *Tomorrow's world : Britain's share in a sustainable future*. London: (Earthscan Publications)
- Meadows, Donella, J Randers, and Dennis Meadows. 2005. *Limits to Growth - the 30-year update*. London: (Earthscan)
- Smith, Ethan T, and Harry X. Zhang. 2004. Developing Key Water Quality Indicators for Sustainable Water Resources Management. Paper read at 77th Annual Water Environment Federation Technical Exhibition and Conference, at Alexandria, Virginia.
- Wackernagel, M, and W Rees. 1996. *Our Ecological Footprint: reducing human impact on the earth*. Gabriola Island: (New Society Publishers)
- WB. 2003. *Social Analysis Sourcebook: incorporating social dimensions in to Bank-supported projects*. (Washington: World Bank)
- Wood, Donna J. 1991. Corporate Social Performance Revisited *Academy of Management Review* 16 (4):691-718.