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Review

The Environmental Millennium Development Goal: progress and barriers to its achievement

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ABSTRACT

Ensuring environmental sustainability is the aim of the seventh Millennium Development Goal (MDG7). United Nations data shows insufficient progress, especially in developing countries. In order to generate new information about this progress and the main barriers that hinder it, we conducted a systematic review to describe the scientific evidence concerning MDG7, and to analyse the quality of the studies. In order to identify all empirical quantitative studies (ecological, descriptive study, cross-sectional, case-control, and cohort), we searched the following databases between 23 and 26 June 2009: PubMed, EMBASE, ISI WoK, SCOPUS, EBSCO-Greenfile, CAB Abstracts, and LILACS. We identified six empirical studies which reported serious difficulties in the progress of MDG7 and identified socio-economic inequalities, lack of infrastructure and contamination of water sources as the main barriers hindering its achievement.

Environmental issues do not seem to be a priority in research and political agendas, while the international organisations continue to insist that the objective is extremely important. It is necessary to generate scientific knowledge around MDG7, and identify weakness in the indicators in order to adapt policies to the new challenges and make decisions based in best evidence.

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1. Introduction

The Millennium Development Goals (MDG) were established in the year 2000, in the United Nations Millennium Declaration, with the support of 191 member states and constituted a significant institutional agreement for a global strategy to

achieve the basic conditions for development, health and welfare (United Nations, 2000a,b). Ensuring environmental sustainability is the aim of the seventh Millennium Development Goal (MDG7), and includes Target 9, refers to integrate sustainable development into the policies and reverse the loss of environmental resources, Target 10, refers to halve the

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proportion of population without access to safe water and basic sanitation, and Target 11, refers to improve living conditions of slums dwellers. In the preceding years, there were other international initiatives which drew attention to global environmental issues and the importance of sustainability on population health. These included The Earth's Summit in Rio de Janeiro ([United Nations Conference on Environment and Development, 1992](#)) and the Kyoto protocol agreements ([United Nations Framework Convention on Climate Change, 1997](#)).

The integration of environmental issues into population health frameworks is now widely accepted and can be seen in Dahlgren and Whitehead's 'rainbow model' of the social determinants of health ([Dahlgren and Whitehead, 2007](#)). In this model, environmental conditions interact with the socioeconomic and cultural context, with working and living conditions, and influence population health. Other authors have stated that sustainable population health depends on the viability of the planet's life-support systems ([McMichael et al., 2003](#)), and investments in environmental sustainability policies are necessary to reduce poverty and inequalities ([Sachs and Reid, 2006](#)). Furthermore, in the MDG strategy, environmental sustainability directly influences other MDG, such as the eradication of hunger, the reduction in infant mortality, the improvement of maternal health and the fight against infectious diseases ([Melnick et al., 2005](#); [McMichael and Butler, 2006](#); [Anyangwe et al., 2006](#); [Prüss et al., 2002](#); [Varis, 2007](#)).

Given the effects of climatic change, environmental sustainability is currently a priority in the agenda of many governments in developed countries. Nevertheless, it is developing countries who face the greatest challenges in achieving the Environmental Millennium Development Goal's targets, and predictive models presented in some papers show the situation worsening in the forthcoming decades ([Sahn and Stifel, 2003](#); [Chakravarty and Majumder, 2008](#); [Agénor et al., 2006](#)).

An annual report made by The United Nations which monitors the progress of the MDG ([United Nations, 2000a,b](#)) shows that the situation of the MDG7 is not very promising especially for countries with greater socioeconomic problems ([United Nations, 2009](#)); the number of people who continue to use solid fuel in developing countries is increasing, the forest mass is still decreasing at a rate of about 13 million hectares per year, and although the percentage of people without access to drinking water and basic sanitation facilities is falling, it does so too slowly, especially in the poorest countries. Furthermore, although the number of people living in slum conditions is declining ([United Nations, 2009](#)), the rapid expansion of towns and the mass exodus towards urban and peri-urban areas, are causing an increase in the number of settlements without basic sanitation and health conditions ([Satterthwaite, 2003](#); [Varis, 2006](#)).

Although the information collected by the UN reflects the inequalities among countries in terms of the progress of the MDG, more information is required in order to identify the barriers which hinder the progress of the MDG ([Gil-González et al., 2008](#)). Increasing scientific knowledge about the situation of MDG7 and its targets should complement the information in the annual reports of international organisations, and help identify the determinants which act as

obstacles to the progress of this goal. In addition, the use of systematic methods to review the evidence should help public and environmental institutions develop evidence based policies.

Consequently, this study aims to describe the scientific evidence concerning the progress of the Millennium Development Goal 7, to identify the barriers which could hinder its achievement, and to analyse the quality of the empirical studies in this area.

2. Materials and methods

A systematic review was carried out of all empirical studies whose primary aim was (1) to describe the situation of the Millennium Development Goal 7 or one of its targets, and (2) to analyse the barriers which hinder their progress.

2.1. Eligibility criteria

For the purposes of this review, two types of studies were included.

First, we selected all empirical quantitative studies like: ecological, case study, cross-sectional designs and which describe the state of progress of the Millennium Development Goal 7 or one of its targets, in any country or region.

Secondly, we included all empirical quantitative studies which designs were: ecological, case study, cross-sectional, case-control, cohort that identified and analysed potential barriers (economic, political, social, cultural, and geographical) which could hinder the attainment of the Millennium Development Goal 7 or any of its targets.

Studies which addressed environmental problems without any specific reference to the Millennium Development Goals were excluded because our main objective was to explore the progress and barriers in the achievement of this specific goal. Those concerning interventions to improve the environment, and those which set out to analyse other MDGs using MDG7 indicators were also excluded.

2.2. Search strategy

We searched seven environmental, health and multidisciplinary electronic databases for documents of any type, from any country, available in English or Spanish, and published between 2000 and 2008. The decision to include only studies published on or after the year 2000 was made because this was the year that the Millennium Development Goals agreement was signed. Details of the databases searched and the search terms are shown in [Box 1](#). The search strategy used text words rather than Medical Subject Headings because this tool is only available in one of the databases (PubMed), and because of the multidisciplinary nature of the topic.

In order to explore all possible sources of information, we also searched the reference section of the included studies, and we performed a hand-search of four of the most relevant journals restricted to 2007, 2008 and 2009. These journals were "Environmental Health Perspectives" (United States National Institute Environmental Health Sciences), "Global Environmental Change -Human and Policy Dimensions-" (Elsevier),

Box 1. SEARCH STRATEGY OF PAPERS RELATED TO MDG7.

Search terms	Databases						
	PubMed* (23-6-2009)	EMBASE* (23-6-09)	ISI Web of Knowledge* (23-6-2009)	SCOPUS* (25-6-2009)	EBSCO- Greenfile* (26-6-2009)	CAB Abstracts* (26-6-2009)	LILACS* (26-6-2009)
“millennium development goals” OR “MDG” AND “Environmental sustainability”	8	11	24	61	8	18	11
“millennium development goals” OR “MDG” AND “environmental policy”	0	0	1	64	15	4	0
“millennium development goals” OR “MDG” AND “sustainable development”	13	8	45	171	28	30	8
“millennium development goals” OR “MDG” AND “biodiversity”	4	3	13	22	8	16	3
“millennium development goals” OR “MDG” AND “water” AND “sanitation”	18	18	54	71	19	34	18
“millennium development goals” OR “MDG” AND “slums”	5	6	14	20	5	4	6
TOTAL	48	46	151	409	83	106	46

*Limits: Publication Date from 2000/01/01 to 2008/12/31.

“Water Policy” (International Water Association Publishing), “Environmental Science and Policy” (Elsevier). Finally, we searched for grey literature on the websites of prominent nongovernmental organisations: Global Footprint Network (Global Footprint Network, 2009), WWF international (WWF, 2009), Greenpeace international (Greenpeace, 2009); and other international organizations: United Nations Millennium Development Goals (UN, 2009), United Nations Development Program (UNDP, 2009), United Nations Environmental Program (UNEP, 2009).

2.3. Data extraction

We located 889 potential documents in the databases, of which 26 (2.9%) were selected for examination in more detail. The first reviewer (LD) excluded 526 (59.1%) repeated papers, 243 (27.3%) reviews, 39 (4.3%) conference papers, 46 (5.1%) editorials, and 9 (1.01%) papers in languages other than English or Spanish. No potentially included papers were identified in the other searches (reference section, hand-searched journals or grey literature).

The 26 studies selected for potential inclusion were independently appraised by two reviewers (LD and DG), and any disagreements solved by discussion. The following information was extracted from all studies that were finally included in the review: country in which the study took place, objective, design, sample population, data source, target or targets studied, indicators used, results, conclusions and recommendations. For those studies which identified barriers that could hinder the achievement of the MDG7, the information was extracted and shown in the conclusion section.

2.4. Critical appraisal

For the critical appraisal of the published studies we used criteria adapted from published systematic reviews (Bambra

et al., 2008), electronic tools like the STROBE Statement (STROBE, 2009) and a proposed checklist for the critical analysis of cross-sectional studies (Berra et al., 2008) (Box 2).

3. Results

Of the 26 studies selected for potential inclusion, 20 (76.9%) were excluded: 8 (40.0%) addressed issues relevant to the MDG7 targets but did not make reference to the MDG strategy, 6 (30.0%) analysed other MDGs, 3 (15.0%) papers were econometric studies which set out to predict MDG progress, 2 (10.0%) were interventions to improve the environment, and 1 (5.0%) was a proposal of indicators to measure environmental factors. Finally, 6 (23.1%) studies were included (Rehfuess et al., 2006; Mwendera, 2006; Gundry et al., 2006; Dominguez-Aguilar and Garcia-de Fuentes, 2007; O'Hara et al., 2008; Martinez et al., 2008).

3.1. Characteristics of studies

Table 1 shows the main characteristics of the papers. Regarding the study design, there were two ecological studies

Box 2. Critical appraisal criteria.*

1. Is the study carried out in a representative sample population?
2. Does the study include an appropriate comparison group?
3. Is the baseline response greater than 60%?
4. Is there any adjustment for potential confounders?
5. Were appropriate statistical tests used?
6. Are any limitations to the study identified?
7. Does the study use a pre-validated outcome measure?

*Adapted from: Bambra et al. (2008), Berra et al. (2008) and Strobe Statement (2009).

Table 1 – Characteristics of the studies systematically analysed which describe the progress of the Millennium Development Goal 7 or identify barriers which hinder its achievement.

Author	Country	Objective of study	Type of study	Sample	Data source	Target or targets studied	Indicators used	Results	Conclusions (barriers identified and future recommendations)
Mwendera (2006)	Swaziland	Analyse the rural water supply and sanitation coverage in Swaziland	Descriptive study	Households of Swaziland	National	Target 10	Proportion of population with sustainable access to an improved water source (UN) Proportion of population with access to improved sanitation (UN)	Rural water supplies coverage increased 56–60% between 2004 and 2005 Rural sanitation increased from 61% to 63% in 2004 and 2005 In 2022 coverage for water and sanitation will be 100%	Increased funding from government is needed to achieve 100% coverage of water and sanitation There are serious problems of structural poverty and unequal income distribution in the country There is a strong need to get political will to improve people lives
Gundry et al. (2006)	Zimbabwe and South Africa	To assess contamination of drinking water in rural areas of South Africa and Zimbabwe	Cohort study	254 children aged 12–24 months	National	Target 10	E. coli counts in improved an unimproved water sources	Improved sources analysis: samples with E. coli count less than 10 cfu/100 ml were: at source 165 (88%); in household storage 137 (59%); in drinking cups 91 (49%) In unimproved sources were: at source 47 (29%); household storage 32 (19%); drinking cups 21 (18%)	Improved sources used to deliver safe water, but 12% were contaminated and as such were “unsafe” In household storage, more than 40% of samples were “unsafe” For the purposes of MDG monitoring, the assumption that an improved source means “safe water” is unrealistic
Rehfuess et al. (2006)	WHO regions	An assessment of household solid fuel use on a country-by-country basis, and implications for achieving MDGs at large	Ecological study	181 countries from WHO regions	International	Target 9	Proportion of population using solid fuels (UN)	52% of the world population uses solid fuels 77% in Sub-Saharan Africa 16% in Latin America and Central and eastern Europe Less 5% in most industrialized countries	Trends confirm that “Proportion of population using solid fuels” is decreasing, but some regions (Sub-Saharan Africa) continue off-track on achievement of MDGs It is urgent to develop agendas to include this indicator in political action

Dominguez-Aguilar and Garcia-de Fuentes (2007)	Mexico	To discuss some of the barriers faced in Cancun to achieve MDG7 targets of water and sanitation	Descriptive study	6 zones from the richer hotel zone to the peri-urban squatter settlements which represent 485,346 inhabitants	National	Target 10	Proportion of population with sustainable access to an improved water source (UN)	4 of the 6 zones had access to a safe drinking water	The socioeconomic disparities produced by market forces, and reinforced by government policies, mean that the richest have better access than the poorest to safe water and sanitation Failure of State Drinking and Sanitation Law, for economic and political factors The lack of concern shown by social actors to aquifer contamination Cancun government needs to act to achieve MDG water and sanitation at local level
							Proportion of population with access to improved sanitation (UN)	2 of 6 had access to an improved sanitation	
Martinez et al. (2008)	CIS in Asia	To analyse the trends in the living conditions of slum and non-slum populations over the period 1990–2003	Ecological study	188 cities of the 8 millennium development regions	International	Target 11	Proportion of population with sustainable access to an improved water source (UN)	Median access remains above 90% through alternative water sources	There is a general improvement in various shelter and quality life conditions In most sub-Saharan African countries, there was an increase in inequalities Growth of peri-urban settlements has signified the need of urban development programmes to improve living conditions Issues of urban development and poverty such as social exclusion, and regional differences are not reflected in the indicators
	Eastern Asia						Proportion of population with access to improved sanitation (UN)	Median connection to piped water rose from 56% to 65% (1990–2003)	
	LAC							Median percentage connection to sewers increased from 44% to 70% (1990–2003), Sub-Saharan Africa had a median of 13%	
	Northern Africa								
	South-eastern Asia Southern Asia Sub-Saharan Africa Western Asia								

Table 1 (Continued)

Author	Country	Objective of study	Type of study	Sample	Data source	Target or targets studied	Indicators used	Results	Conclusions (barriers identified and future recommendations)
O'Hara et al. (2008)	Kazakhstan	To conduct a survey to quantify the current level of access to safe water and basic sanitation	Cross-sectional study	7515 people in urban and rural areas	National	Target 10	Proportion of population with sustainable access to an improved water source (UN)	55% of the population live in a house which is connected to a piped water supply 86% in cities 16% in rural areas	There are socioeconomic inequalities related to access to water, not always safe water Infrastructures need to be maintained, most sources do not work Kazakhstan is off-track, needs efficient policies and better indicators to measure this target

(Rehfuess et al., 2006; Martinez et al., 2008), two descriptive studies (Mwendera, 2006; Dominguez-Aguilar and Garcia-de Fuentes, 2007), one cohort study (Gundry et al., 2006), and one cross-sectional study (O'Hara et al., 2008). The sample populations studied were highly heterogeneous: one study analysed 254 children (Gundry et al., 2006), while another studied 188 countries from WHO regions (Rehfuess et al., 2006).

The data sources used for analysis were national data in four studies (Dominguez-Aguilar and Garcia-de Fuentes, 2007; Mwendera, 2006; Gundry et al., 2006; O'Hara et al., 2008) and international data in the other two studies (Rehfuess et al., 2006; Martinez et al., 2008).

The most studied MDG7 target was Target 10: "To halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation". It was the objective of study in four papers (Dominguez-Aguilar and Garcia-de Fuentes, 2007; Mwendera, 2006; Gundry et al., 2006; O'Hara et al., 2008). One study analysed Target 9: "To integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources" (Rehfuess et al., 2006), and one study analysed Target 11: "By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers" (Martinez et al., 2008).

To measure the situation of MDG7, 5 of the studies used indicators defined by the United Nations, such as: "Proportion of population with sustainable access to an improved water source" or "proportion of population with access to improved sanitation" (Dominguez-Aguilar and Garcia-de Fuentes, 2007; Mwendera, 2006; Gundry et al., 2006; O'Hara et al., 2008; Rehfuess et al., 2006). One study (Gundry et al., 2006) used a microbiological indicator: "Escherichia coli counts in 100 ml of water"

The main results, conclusions and recommendations of the studies were analysed.

- Analysis of Target 9:

An ecological study (Rehfuess et al., 2006) which analysed household solid fuel use in the WHO regions showed that 52% of the world's population still uses solid fuels. The most extensive use was in the Sub-Saharan Africa region (77%), while in industrialized countries solid fuel uses was under 5% of the population.

- Analysis of Target 10:

One study (Mwendera, 2006) described the situation of Swaziland's water and sanitation coverage. The analysis showed slow improvement in both indicators (56–60% in 2004–2005 for water supplies, and 61–63% in 2004–2005 for basic sanitation), and expressed an expectation of reaching 100% of coverage by 2022. To reach this target the government would need to increase funding and develop a plan to solve the serious problem of structural poverty and income inequality in Swaziland.

Another descriptive study (Dominguez-Aguilar and Garcia-de Fuentes, 2007) was carried out in Cancun city (Mexico). The authors carried out an analysis of the access to safe drinking

water and basic sanitation in order to identify the barriers which prevent the city from achieving Target 10. They divided Cancun in six zones (ranging from a rich hotel area to peri-urban settlements) and observed that only four of six zones had access to safe drinking water, and only two had access to improved sanitation.

The cohort study (Gundry et al., 2006) explored the contamination of drinking water in rural areas. They studied both improved water sources and unimproved water sources and took a sample of water to measure how much *E. coli* was present. Unimproved sources had a higher number of *E. coli* than was expected, but improved sources also had *E. coli*. They concluded that populations that have access to improved sources of water do not always have access to “safe water”.

The cross-sectional study (O'Hara et al., 2008) estimated the level of access to safe water of the urban and rural population of Kazakhstan. Over 55% of people had a piped water supply in their home, but there was a great difference between cities and rural areas (86% vs. 16%). There were a high number of sources which were deteriorated, most of them in rural areas; this situation may lead to “unsafe” water from piped water supplies.

- Analysis from Target 11:

Another ecological study (Martinez et al., 2008) described the trend of slum dwellers during the period 1990–2003. The results were positive as an improvement was observed in most Millennium Development regions; most reach 90% access by using alternative supply systems. Access to piped water rose from 56% to 65% in the period 1990–2003, and basic sanitation increased from 44% to 70% in the same period. Nevertheless, sub-optimal access to safe water and basic sanitation persisted in the cities of Sub-Saharan Africa during this period.

Among the studies which identified barriers to achieving MDG7 or any of its targets, the most frequent were *socioeconomic inequalities* (Mwendera, 2006; Dominguez-Aguilar and Garcia-de Fuentes, 2007; O'Hara et al., 2008), the *deterioration of infrastructure* providing access to water and basic sanitation due to the *lack of economic investments* (O'Hara et al., 2008; Gundry et al., 2006; Mwendera, 2006), the *contamination of water sources* (Gundry et al., 2006; Dominguez-Aguilar and Garcia-de Fuentes, 2007), and the *lack of political will* (Dominguez-Aguilar and Garcia-de Fuentes, 2007).

3.2. Critical appraisal results

The results of the critical appraisal can be seen in Table 2. Five of the six studies were considered to have a representative sample. One study (O'Hara et al., 2008) had a small sample which was not considered to be representative. None of the studies used a comparison group in its methodological design.

In four of the six studies, the baseline response was greater than 60%. Only the cohort study (Gundry et al., 2006) made an adjustment for potential confounders. All of the studies used statistical tests considered appropriate for their designs. Three papers identified potential limitations of their studies: one study (Martinez et al., 2008) declared that most of the analyses were carried out on a particular proportion of the city which may limit the external validity of the data; while another

(Rehfuess et al., 2006) stated that there were limitations related to data extraction and estimation methods. The cross-sectional study (O'Hara et al., 2008) declared that the small study sample was a limitation. All studies used validated measures; most of them were United Nations indicators established to measure the progress of the Millennium Development Goals (i.e. % of population with access to safe drinking water).

4. Discussion

Scientific knowledge concerning the progress of MDG7 and analysing the obstacles that could hinder its achievement is essential to help these environmental agreements move forward. Only six empirical studies which provide information about this issue were identified in our review. The studies affirm that the progress of the MDG7 is limited at international, national and local level. The studies were highly heterogeneous in terms of theoretical frameworks, objectives, and methods, including samples and designs. Furthermore, this heterogeneity implies problems in the quality analysis of the studies.

The situation of MDG7 must be improved in order to accomplish the objectives (UN, 2009), and new information about the determinants of non-attainment are needed. In our review, we identified socioeconomic inequalities, lack of proper infrastructure and deficient management, lack of political will at the local level, and contamination of the sources assigned to provide water to the population as the main barriers which hinder the progress of MDG7. This information is relevant in terms of political action, especially at the local and national level, and helps to build new policies to avoid obstacles of its achievement.

We only found one review regarding MDG progress (Palma-Solis et al., 2009a,b) in which political and economic factors were identified as barriers. These barriers were also identified in our research. We know that an increasing amount of knowledge exists around other MDG. For instance, Fotso et al. (2007) analyse how urban growth, access to drinking water and vaccination coverage affect progress towards MDG 4 in Sub-Saharan Africa. Palma-Solis et al. (2009a,b) analysed policy determinants of the MDG1 (hunger and poverty), identifying government consumption as a barrier to achieve MDG1. Furthermore, Houweling et al. (2007) propose research to demonstrate how socioeconomic inequalities in maternity care affect Goal 5 (reduction in maternal mortality). We identified less information for MDG7 than for the other MDGs. However, scientific knowledge is fundamental for the design of further interventions to achieve the Millennium Development Goals (Tugwell et al., 2006) and could identify structural or social problems that prevent the achievement of this macro agreement and future agreements.

A large scale international agreement on the environment such as the Rio de Janeiro (UN, 1992) declaration on environment and development, which laid the foundations for action against what was then an emerging problem, and the Kyoto Protocol (UNFCCC, 1997) for the reduction of contaminating gases, failed to achieve the targets set out. It would seem that MDG7 will go the same way. Despite the

Table 2 – Critical appraisal of studies which describe the progress of the Millennium Development Goal 7 or analyse the barriers that would hinder their achievement.

	Is the study carried out in a representative sample population?	Does the study include an appropriate comparison group?	Is the baseline response greater than 60%?	Is there any adjustment for potential confounders?	Were appropriate statistical tests used?	Are any limitations to the study identified?	Does the study use a pre-validated outcome measure?
Gundry et al. (2006)	Yes. 12 households from two villages with child aged between 12 and 24 months were randomly selected	No. They do not include a comparison group	Yes	Yes Health care access Type of sources Type of vessel and material	Yes. Interval regression analysis. Logistic regressions analysis	No	Yes. <i>E. coli</i> concentration in water
Martinez et al. (2008)	Yes. They include 188 cities from Millennium Development Goals Regions	No. They do not include a comparison group	Yes	No	Yes. Descriptive statistics box plots. Cluster analysis	Yes. Most analyses rely on a fraction of the cities. Such constraints raise methodological issues that limit interpretability	Yes. Durable structures, access to safe water, appropriate sanitation and infant mortality
O'Hara et al. (2008)	No. They included 7515 people in urban and rural areas (0.05% of total population of Kazakhstan)	No. They do not include a comparison group	Yes	No	Yes. Descriptive analysis: percentages and frequencies	Yes. Small sample	Yes. Household with water connection, access to improved water and source type
Mwendera (2006)	Yes. Case study from Swaziland	No. They do not include a comparison group	No	No	Yes. Descriptive analysis: percentages and frequencies	No	Yes. % water coverage and % sanitation coverage
Dominguez-Aguilar and Garcia-de Fuentes (2007)	Yes. 6 zones in Cancun (Mexico)	No. They do not include a comparison group	No	No	Yes. Descriptive analysis: percentages and frequencies	No	Yes. Access to safe drinking water and access to improved sanitation
Rehfuess et al. (2006)	Yes. 181 countries from WHO regions	No. They do not include a comparison group	Yes	No	Yes. Linear regression	Data availability and estimation methods	Yes. % of population using solid fuels

importance of ensuring environmental sustainability of population health and welfare (McMichael et al., 2008), the environmental issue do not seem to be a priority in research and political agendas, while the international organisations continue to insist that the objective is extremely important (Sachs and McArthur, 2005; Jolly, 2004) and urge countries to persevere.

A discipline like political epidemiology could play a key role in the identification of political determinants which affect social factors and progress of MDGs, and in the proposal of future public policies to improve the achievement of targets. With MDGs, the UN applies a model comprised of wishful thinking, opinion, and good intentions that is limited by the lack of a solid scientific base, given the dearth of scientific information concerning the health implications of political initiatives (Gil-González et al., 2009).

We encountered limitations when carrying out this systematic review. The first of these was the small sample of studies, their heterogenic characteristics, and the fact that they are studies which came from different disciplines like urbanism, environment, health, and development. In addition, all of the studies expressed their results in a particular form. We also had difficulties extracting data and comparing results between papers with different designs, which in most cases only permitted a descriptive analysis of their results. Finally, knowledge relevant for the MDGs may be generated in many contexts; e.g., by scientists unaware of MDGs or by institutions with no interest in MDGs, but we limited our research to knowledge generated around MDG7 through empirical studies published in scientific journals and grey literature from different organizations.

In the current framework of climate change, it is essential to implement policies for sustainable development and preservation of natural resources, the use of renewable, clean energy (Haines et al., 2007), and sustainable urban development. These may provide the definitive push towards the environmental goal, and could enhance the situation of the health and education targets (McMichael et al., 2008; Bartram et al., 2005). Furthermore, it is important to create a space for reflection (James, 2006; Anand, 2007; Bass et al., 2006) which would enable a detailed review of the weak points (Murray, 2007) of the indicators for measuring progress, in order to adapt them to the new challenges of the environment.

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