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# Project Management Sustainability

Planning, analysis and control project  
sustainability environmental

MANAGEMENT

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*For Alessandro,  
from whom all began*



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## Introduction

The ideas and proposals contained in this book have been stimulated both by the acquisition of knowledge by the authors of a underlying and not considered relationship among the projects and the surrounding world, but also by the new sensibility that manifests itself in an increasingly strong to the effects that human actions have on the environment in which they are made.

To understand the invisible connection we must consider that if it is true that projects are tools we use to meet our needs and we cannot deprive us of our ability to undertake, it is also true that the projects with their processes, contribute to the change of the environment in which they are made, don't only undergo it.

In fact, projects to develop deliverables for which they were undertaken, producing impacts (both economic and social on the natural environment) and use energy. In practice of increasing the GDP and ensure social welfare, projects consume energy and produce waste.

The new sensitivity on the effects of human acts is evidenced by the infiltration into the common thoughts of intergenerational equity concepts, by the increased permeability of the strategies that companies and their processes have about the “green” sensitivity, from the acquisition by of specialized *rating* agencies of economic, social and environmental impacts (*triple bottom line*) that companies produce to provide their assessment (*Dow Jones Sustainability Indexes*).

All this leads us to believe that *sustainability* in project management and the careful management of the energy needed in the project have become key points to make our actions acceptable. That's why we need to define a new area of knowledge that targets the aim of satisfying the growing interest of stakeholders on how to get the project objectives.

Because of its importance to our future, environmental sustainability must be integrated into project management, the PMP community must develop the concepts and practices in order to operate the same way as we do for quality, risk, communication and the other areas of knowledge.

In this book the authors have described this new area of knowledge with the processes, inputs, outputs, tools and techniques involved. They have also described the interaction between the processes of this new area and those of other existing.

The authors consider this book only the beginning of the process that will lead to a shared definition of this new area, a tool that will stimulate the entire PM community to extend and reinforce and get it as good practice in project management.

## **The proposed reading of the authors**

To be faithful to the principles of sustainability described, the authors suggest the reader to jump in Appendix 3 and read the presentation, in this way the reader will be aware of its interest in the issue presented in the book. If the authors were able to capture the reader's interest, it can engage in a systematic reading and also find itself applying a case study appropriately contextualized in the process of managing environmental sustainability. Otherwise, authors and readers have contributed to curb their Ecological Footprint.

## **Acknowledgments**

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Giancarlo Duranti for the technical contribution and his friendly insistence to make this job available for the entire PMP community.



# 1

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## Projects and environmental impact

*The Earth is not inherited from our fathers,  
but is borrowed from our children*

To address the management of environmental projects, it is useful to clarify the meaning in this book is given to projects and environmental impact (sustainability).

According to the definition provided by the Project Management Institute “project” means a temporary endeavor with a beginning and an end, undertaken to create a product, service or result unique (the deliverables) achieved through a progressive elaboration.

The definition of environmental impact provided by the Brundtland Commission of the United States, March 20 1987 is: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

The most common definition of environmental impact is the sum of the effects caused by an event, an action or behavior on the environment as a whole to show what indeed can produce a change. Change is not necessarily a bad thing but it alters the environment considered in its broadest sense (social, economic, environmental). You try to predict what the costs and benefits in the event that changes occur in a state of affairs.

From the definitions of project and environmental impact is clear their intrinsic relationship. In fact, the projects are the means by which we try to satisfy our needs. They use processes starting from

input and using tools to produce output, so a process or project (as a set of processes) changes the system where it operates.

This aspect is often neglected, typically the project manager's attention is focused on the effects that the project suffers by changes in the environment in which it is undertaken. For example a reduction in the company's budget (the environment) may lead to lower budget of the project. In reality, the project will also change the system in which it acts. Both the creation of *deliverables* that the closing of the project, it is possible to measure the impact it has caused: the first line of the economic income of the company or to increase the GDP, as well as satisfaction of social needs or the growing fears and those of environment as impoverishment of its initial assets and the increase of foreign material solid, liquid or gas.

From the definition itself of environmental impact of projects and from the actions on the system where they are undertaken, it follows that each project therefore creates an environmental impact.

Become aware of this reality as a project manager does not mean wanting to give up our ability to undertake, but it means keeping in mind the definition of environmental impact proposed by the Brundtland Commission.

In the following chapters we will analyze how to make acceptable our operations by expanding our knowledge and awareness on sustainable development to insert it fully into the project management.

## **1. *SEE impacts and green impacts***

The definition of work in physics tells us that any process that produces a change in the system where it is placed makes a job. To do work it takes energy, in fact the definition of energy is “the ability to do work”.

It follows that a project as a set of processes modifying the system in which it is undertaken, taking a job and therefore energy is required to achieve the desired results.

Previously we said that a project produces environmental impacts also such *SEE Impacts* the acronym formed by the corresponding words: *Social, Economic and Environmental*.

Often the *SEE Impacts* are mixed up with the *green impacts*, but they are two different concepts related to different stages in the analysis of sustainability of a project.

The *green impacts* concern to the initial phase of the project or its process when we analyze the energy required.

The *SEE Impacts* for the environmental component are generated by using the energy needed for the project achieving its deliverables. In order to increase the GDP and to ensure social well-being, energy resources (*green impacts*) will be consumed and waste are produced, in addition to the economic and social effects (*SEE Impacts*).

The direct waste require energy to be disposed, the indirects, such as scrapping the obsolescence of old products, requiring addition of energy used for produce them, that is lost.

To ensure the best possible solution, we must always know how to manage energy well. Having this knowledge and awareness provides the basis for making sustainable our operations.

## 2. The energy availability is a problem?

When we think about the human use of energy, is inevitably try the audacious confrontation with the use that nature takes about the energy sources. This comparison admittedly can not see us winning.

As Nicola Armaroli and Vincenzo Balzani remind us in their excellent book (2008) the spaceship Earth in the universe travels at 29 km / s without consuming energy resources, but serve it a lot for the needs of its passengers.

Their consideration makes explicit the results of the comparison, but the authors also remind us that for every kg of body walk we consume 3.5 kJ / km and 30 kJ / km in the car. Already imagine your first thought: I'll never walk faster as by car. This is always true and it saves time (non-renewable resource) for medium-long distances, less in town and on short trips. We must know how to make an appropriate choice.

Let us now the basic question: the availability of energy is a problem? Our answer is 'yes' for the following main reasons:



- population growth;
- equal dignity in energy consumption;
- peak oil extraction;
- limits of the Earth.

The first two are defined stress factors related to energy consumption, the third is a stress factor related to energy production, the fourth factor is an embedded boundary.

According to forecasts provided by ONU on increasing population, over the next 30 years on planet Earth the growth of human guests will amount to 2.5 billion people. In practice around 2050 we'll increase from the current number of 6.7 billion people to 9 - 10 billion of people. The rate of daily increase is about 200 thousand inhabitants more, on an annual basis the rate of increase is 75 million more inhabitants.

A most effective way to understand the value dimension of these numbers is to remember that the daily increase is equivalent to a standard province in Italy, the annual increase is about a medium-big sized European nation. Imagining equal energy conditions, all of these people will require an increase in the production of energy for lead their lives.

If we limit ourselves to the present situation without making projections about the future, we have some difficulties that are evident from the results of the various conferences that take place on planet Earth.

Today we do not consume energy equally in the world because there are different lifestyles, Figure 1 presents a comparative analysis of energy consumption of citizens belonging to different nations and it highlights the huge disparity.

*Fig. 1 – Energy consumption compared between citizens of different nations*



Because not everyone can consume as the first on the list, we require the world's poor Countries to grow moderately and without polluting, those Countries in turn remind us of our duties as a signatory to international protocols for pollutant emissions and so in the boat where all of us are in, we risk of slowly roasting.

Because we believe in the power of numbers to represent effectively the concepts, we introduce another unit borrowed from studios of the subject: the ecological footprint.

The ecological footprint (IE) is the area of land surface capable of providing the resources necessary for the daily consumption of a person and to dispose of waste. The Earth today can bear IE average of 1.8 hectares (h) for inhabitant. Once again, not all people have the same weight. In fact, the value of IE is equal to 9.6 h for an American, for an Italian is 4.2 h, for an Eritrean equal to 0.7, for an Afghan equal to 0.1. If everyone had the highest IE, it would take about 4 Earths.

About the stress factor that relates to energy production, there is considerable debate about the time at which there will be the peak of oil extraction, but no one doubts at this time on his arrival. The provided period will be from 10 to 50 years. This difference is almost always tied to the extraction of the "difficult oil" that is what takes a lot of "effort" to be made available for energy.

In general, the numerical evaluation of energy advantage also from different sources uses the EROEI (Energy Return On Energy Invested), defined as the ratio of energy produced and energy expenditure in the production phase. Its minimum value is 1, but the minimum economically profitable is 2-3 and today is common extracting from wells with a value of EROEI of 10.

In comparison, some people suggest to use the oil residue with caution and prepare a socio-economic system capable of operating with a reduced availability of oil and fossil fuels.

Let us analyze, finally, the embedded factor of boundary: limits of the Earth. In the dossier "Earth 3.0 solutions for a sustainable future" of the magazine *The Sciences* (2010) it presents the nine environmental processes for which scientists have established limits that if exceeded could make Earth uninhabitable. For three of these

processes, indicated below with an asterisk, the limits are already exceeded, for others we are approaching the limit too quickly.

The processes are:

- loss of biodiversity (\*);
- aerosol atmospheric;
- chemical pollution;
- climate change (\*);
- acidification of the oceans;
- reduction of the ozone layer;
- nitrogen cycle (\*) and phosphorus;
- consumption of fresh water;
- land use.

For details on the processes by describing the causes, the current value and the critical limit, see the the dossier. What we intuitively understand that the Earth has finite dimensions and we can not expect much availability than its limit.

### **3. In search of the path**

The EU energy consumption from 1999 to 2004 increased by 10.8% in line with GDP, while the regulatory and technology improved energy efficiency, which means that not enough to improve, we must also reduce.

Reduce is possible, in California the richest state in the richest nation in the world, per person energy consumption has now lower than in 1975 (Armaroli, Balzani, 2008).

The only way to protect the future of our society is to manage wisely the riches available looking for a balance between the degree of wealth and resources.

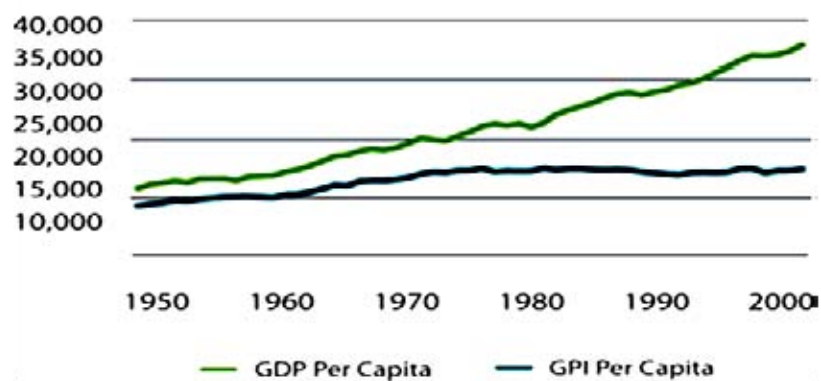
We must strive to identify the path that allows us to reconcile the needs that still oppose it. The business world in which we operate as PM must make a profit, but must do it within the margins of sustainability.

Fortunately we are not a year zero, companies are subject to periodic measurements and monitoring by agencies specialized on

sustainability that produce by indexes (Dow Jones Sustainability Indexes - DJSI) charts of merit. This helps to increase the sensitivity of the companies because of positive or negative economic returns from these rankings descend.

Even States are subject to monitoring not only based on the GDP (Gross Domestic Product - GDP) but also on GPI (Genuine Progress Indicator - GPI) which is the rate of real progress. In fact, the GPI measures the life quality of a nation by distinguishing between positive charges (such as goods and services to increase well-being) and negative costs (costs for pollution, accidents, crime). The GPI is opposed to the GDP.

*Fig. 2 – GDP and GPI per capita from 1950 to 2000 from the website of Redefining Progress*



You can find on the website of Redefining Progress the graph product of some studies that show as in the period 1950 to 2000, GDP growth does not coincide with the growth of GPI (Fig. 2). The foregoing considerations indicate that speak of sustainable development is no longer a taboo, but we need that:

- “green” solutions reduce costs, reducing energy consumption decreases the energy bill in addition to CO2 emissions;
- those who invest receive benefits, the same team must belong to the beneficiary (facility team), the investor (production management) and who makes the money available (management and control);