

## Strategies of sustainable development in practice

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### Industrial management and organisation

#### ABSTRACT

**Purpose:** The paper presents a necessity of the sustainable consumption, production and technology patterns to the companies introduced.

**Design/methodology/approach:** In this article replacing unsustainable consumption and production model into sustainable consumption and production model proposed. Taking into consideration that resources are used beyond the earth's carrying capacity, leading to high waste yields and emissions into the atmosphere and water and inefficient use of natural resources, the only way to improvement this is sustainable development.

**Findings:** The paper presents using sustainable production indicators to estimation of technological processes environmental influences. Indicators have increasingly been used as a tool to measure progress toward sustainable development at different levels - national, regional, local and company.

**Research limitations/implications:** Using the sustainable consumption, production and technology are the only way for better life quality achievement.

**Practical implications:** In the papers presented that achieving sustainable production, consumption and sustainable technology will require changes in industrial processes, in the type and quantity of resources used, in the treatment of waste, in the control of emissions and in the products produced. It is also necessary a development of production indicators to evaluate sustainable production.

**Originality/value:** This article presented a necessity of a new approach to environment protection through sustainable production, consumption and sustainable technology. Sustainable consumption and sustainable production are complementary strategies for making economies more sustainable.

**Keywords:** Environmental management; Sustainable production; Sustainable consumption; Sustainable technology

### 1. Introduction

The unsustainable consumption and production caused the real threat e.g. depleting unrenovable resources which leading to disturbance of ecological equilibrium. The answer on the identification of these threats is the sustainable development [1, 2] conception which is base of all present economic processes and wider human activities. In spite, that it seems that this conception

is generally accepted, well-known and intelligible, in details it is not clear.

The sustainable development ideas and their basic rule relatively can easily describe in the total scale. In the total scale materials used, quantity of waste generated and energy consumption minimization easy is postulate [1,2].

In fact all results in the total scale are a sum of all local economic processes and productive processes in the world. So the basic problem of present economic processes is the elaboration of

the method of the integrated influence on local, individual (elementary) productive events. These local productive events can relate to the level of technological processes and particularly to the materials technological processes [1]. Because of that the materials and materials processes in productive processes and their influence on the environment (and especially for the possibility of the recirculation in the final stage product life cycle) are important.

## 2. Conception of sustainable development

The conception of sustainable development was proposed by the "World Commission on Environment and Development" (WCED) in 1987:

"Sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations.... (It is) meeting to needs of the present without compromising the ability of future generations to meet their own needs" [1].

It follows that the only appropriate dimension when choosing sustainable development as one's ultimate objective, is a global one. After all, the well-being of planet Earth ought to be the concern of the whole human population. Such a common responsibility implies that the different societies on Earth should behave responsibly towards each other, because one can not expect a society whose minimal existence requirements are not fulfilled to give the environment first priority. This indeed was an important theme during the United Nations Conference on Environment and Development (UNCED) or "Earth Summit", held in Rio de Janeiro in June 1992. It was the UNCED's key conclusion that the environment can no longer be disconnected from development. This inevitably implies that environmental science and education cannot be isolated from development either.

The main issues of the Conference included:

- systematic scrutiny of patterns of production — particularly the production of toxic components, such as lead in gasoline, or poisonous waste
- alternative sources of energy to replace the use of fossil fuels which are linked to global climate change
- new reliance on public transportation systems in order to reduce vehicle emissions, congestion in cities and the health problems caused by polluted air and smog
- the growing scarcity of water

An important achievement was an agreement on the Climate Change Convention which in turn led to the Kyoto Protocol. Another was agreement to "not carry out any activities on the lands of indigenous peoples that would cause environmental degradation or that would be culturally inappropriate".

After ten years in Johannesburg the World Summit on Sustainable Development, WSSD took place.

The members of the Summit paid the main attention to challenges on development, and so proportionate division from globalization, poverty limitation from one side and excessively

consumption from the second, international resources management and promotion of the sustainable production and consumption standards. The aim of the Summit ambitious and also possible to realizing the programme of the practical workings which referred both the conditions improvement and the environmental protection was creation.

A few countries have introduced the principle of sustainable development into their laws. Among them is Poland. The article 5 of the 1997 Constitution reads:

"The Republic of Poland shall safeguard the independence and integrity of its territory and ensure the freedoms and rights of persons and citizens, the security of the citizens, safeguard the national heritage and shall ensure the protection of the natural environment pursuant to the principles of sustainable development."

In principle it means that the Constitutional Tribunal may scratch any law it deems incompatible with the principle of sustainable development.

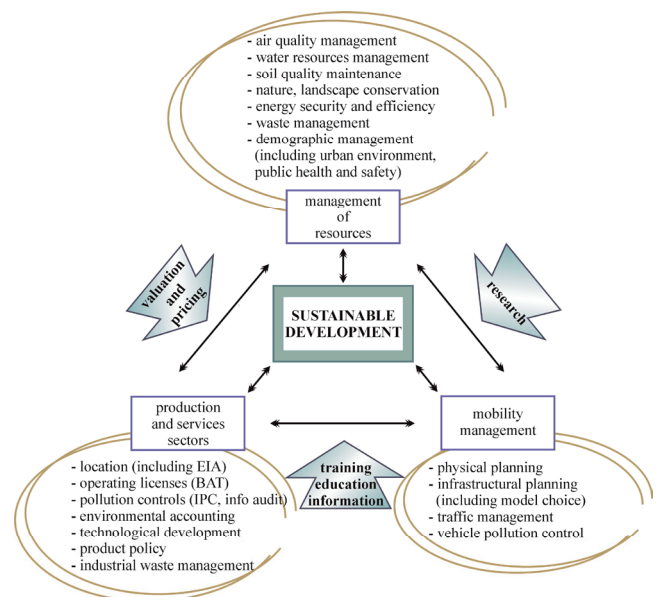


Fig. 1. Schema of approach to sustainable development

The idea of sustainable development [3] exhibits two basic elements: the understanding of the environment degradation seriousness and necessity of its protection and the pursuance to reduction of differences in the level of prosperity. Referring only to the first ecological element of the sustainable development tended the ideal economy guaranteeing the development of the world compatible with environment. In this case we can favour the economy which develops in "harmony" with environment.

The sustainable development from one side it is guidance of every economic activity according to natural rule and from the second, better satisfying of physical and psychological needs of the man (through its suitable relation to environment and the quality of life improvement) [2,3]. Because of that replacement of the unbalanced consumption and production model to sustainable consumption and production model proposed [1, 2] (Fig. 2).

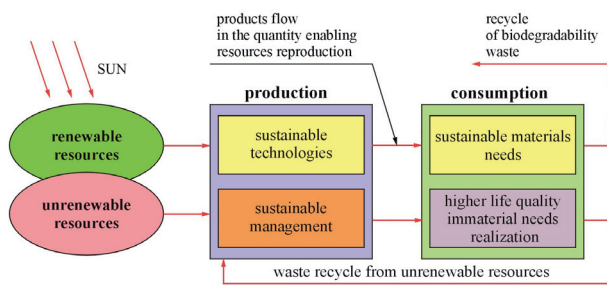


Fig. 2. Sustainable course process model of economic, environmental and social processes [1]

### 3. The sustainable consumption

Sustainable Consumption has been defined as [4]:

“The use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life-cycle so as not to jeopardize the needs of future generations.” (UN CSD International Work Programme adopted in 1995).

Sustainable Consumption [5,6] was one of the main topics dealt with in the World Summit on Sustainable Development Johannesburg 2002.

Meeting the increasing needs of people with improved environmental outcomes requires more efficient consumption. Using fewer resources and causing less pollution is needed to enable human development in all parts of the world. Furthermore, a fundamental shift in how to improve quality of life requires taking into account social and cultural elements as well.

Consumptions patterns are the result of choices and activities of wide variety actors including business, government and individual households. Influencing these choices means stimulating and facilitating new economic opportunities – better products and services – and altering the current infrastructure and regulatory framework that lock consumers into unsustainable behavior [5, 6].

### 4. The sustainable production

The sustainable consumption targets consumers however sustainable production is related to companies and organizations that make products or offer services.

The concept of sustainable production [7, 8] emerged in 1992 at the United Nations Conference on Environment and Development (UNCED) and is closely linked to the concept of sustainable development.

The sustainable production is defines as [7, 9]:

“The creation of goods and services using processes and systems that are: non-polluting, conserving of energy and natural resources, economically viable, safe and healthful for workers, communities and consumers, socially and creatively rewarding for all working people.”

This definition is consistent with current understanding of sustainable development, since it emphasizes environmental, social and economic aspects of firm’s activities. At the same time it is more operational, since it high-lights six main aspects of sustainable production [8]: energy and material use (resources), natural environment (sinks), social justice and community development, economic performance, workers, products.

Companies that wish to become more sustainable in their everyday practices should aim to address each of these six aspects. To promote better understanding of sustainable production among companies, the Lowell Center for Sustainable Production, University of Massachusetts Lowell [9] has formulated ten guiding principles that lay the basis for the present indicator framework (Tab. 1).

Table 1.

Principles of sustainable production [10]

1. Products and packaging are designed to be safe and ecologically sound throughout their life cycle;
2. Services are organized to satisfy real human needs and promote equity and fairness;
3. Wastes and ecologically incompatible by products are reduced, eliminated or recycled;
4. Chemical substances or physical agents and conditions that present hazards to human health or the environment are eliminated;
5. Energy and materials are conserved and the forms of energy and materials used are most appropriate for the desired ends;
6. Work places and technologies are designed to minimize or eliminate chemical, ergonomic and physical hazards;
7. Work is organized to conserve and enhance the efficiency and creativity of employees;
8. The security and well-being of all employees is a priority, as is the continuous development of their talents and capacities;
9. The communities around workplaces are respected and enhanced economically, socially, culturally and physically;
10. The long-term economic viability of the enterprise or institution is enhanced.

#### 4.1. Indicators of sustainable production

Indicators typically provide key information about a physical, social and economic system. They allow analysis of trends and cause-and-effect relationships and thus are a step beyond primary data. Indicators have three key objectives:

- 1) to raise awareness and understanding;
- 2) to inform decision-making and
- 3) to measure progress toward established goals.

What information is needed and how it will be used in practice guide the selection of a particular indicator. In the case of business performance, management is interested in knowing whether a company is achieving established goals and objectives and/or how it compares to others in the sector.

Indicators have increasingly been used as a tool to measure progress toward sustainable development at different levels - national, regional, local and company [10].

The indicators of sustainable production [11,12] would enable identification of more sustainable options through [10]:

comparison of similar products made by different companies, comparison of different processes producing the same product, benchmarking of units within corporations, rating of a company against other companies in the sector, assessing progress towards sustainable development of a sector.

Numerous organizations are presently trying to develop a set of indicators to state the progress of a company towards sustainability. Veleva and Ellenbecker [14] have analyzed four of the best-known indicator frameworks:

- International Organization for Standardization (ISO 14031),
- Global Reporting Initiative (GRI),
- World Business Council for Sustainable Development (WBCSD),
- Center for Waste Reduction Technologies (CWRT).

Results demonstrate that most indicator frameworks are still under development and none is applicable as a whole to evaluate sustainable production.

## 5. The sustainable technology

The problems of the sustainable development in the area of technological problems [13, 14, 15] are very complicated, because many factors consist on it.

The definition of the sustainable technology did not explicit in the literature yet. Because of that the general expression of the definition was proposed. Under the definition of the sustainable technology it should be comprehensible the technology which [1]: rationally uses sources of energy to profit in the possibly greatest degree from sources of renewable energy; engages possibly least resources on the unit of the product, especially relate to renewable resources; uses maximum renewable resources; eliminates the usage of toxic chemical substances which cause the danger for the human health and the environment; refers well founded and long lived product which after the end "lifes" are biodegradability and recycle; eliminates the formation of waste material; is safety for workers and the neighbouring population.

## 6. Conclusions

The main cause of environmental damage is unsustainable production and consumption.

The world population is growing and resources are used beyond the earth's carrying capacity, leading to high waste yields and emissions into the atmosphere and water and inefficient use of natural resources, societies must reorient their consumption patterns and move towards cleaner and safer production patterns.

It is becoming more and more evident that consumers are increasingly interested in the "world that lies behind" the product they buy. Apart from price and quality, they want to know how and where and by whom the product has been produced. In the answer on this the sustainable consumption conception proposed.

Sustainable development is becoming increasingly important for industry. Achieving sustainable production will require changes in industrial processes, in the type and quantity of resources used, in the treatment of waste, in the control of emissions and in the products produced.

Sustainable consumption and sustainable production are complementary strategies for making economies more sustainable.

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