

“GREEN” EMPLOYMENT IN THE MANAGEMENT OF BIOWASTES

PROJECT ACRONYM: Green_Crew

<https://www.serres.gr/greencrew/el/green-crew/>

WP 5: Evaluation & framework development

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Social impact analysis

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SUMMARY

The present Deliverable is a report on the estimated impacts of the activities of the project “Green – Crew” at the local society of the two implementation areas in the Greek side of the cross-border area and specifically at the municipalities of Serres & Nestos.

The report starts with framing out a terminology and definitions context on the thematic of modern municipal solid waste management. It presents the correlations among modern Municipal Solid Waste Management and the notion of the Green Economy, focusing on the rising opportunities for social entrepreneurship and employment generation as a potential benefit of the “greening” of the Solid Waste Sector. It detects the necessary skills for the green economy and pinpoints the needs for “new” training of the local workforce. Next, the report covers the appropriate characteristics that local green entrepreneurship has through a social lens and pinpoints the existing social and economic barriers for the development of a greener management of the MSW at the areas of Serres & Nestos.

The report closes with an assessment of the project’s effects on the local society’s perceptions about social entrepreneurship in the local solid waste management and specifically on composting the organic section of the wastes.

The contents of this Deliverable - study are sole responsibility of Aristotle University of Thessaloniki and can in no way be taken to reflect the views of the European Union, the participating countries the Managing Authority and the Joint Secretariat.

Contents

Preamble	4
1 The Municipal Solid Waste Management & Green Economy.....	8
1.1 Detecting the opportunities for social entrepreneurship and employment of the MSW sector	10
1.2 Employment generation as a benefit of “greening” the Solid Waste Sector.....	11
1.3 Skills for the green economy: towards a new concept of education and training	12
2. Green Entrepreneurship & Green Economy	14
2.1 Stimulating green innovation through a social lens.....	15
2.2 Identifying the Barriers for Realizing a turn for a Greener Economy on the MSW sector at the projects area.....	17
3. The Project “Green – Crew” and its approach for greening the wastes sector.....	20
3.1 The “Green – Crew” enabling conditions for greening the wastes management at the project area – Social impact assessment indicators.....	21
3.2 Social Impact Assessment of the “Green – Crew” project to its implementation area.....	23
3.3 Analysis and comments on the selected indicators for the “Green – Crew” project	24
3.4 Conclusions and highlights on the social impacts of the Green Crew project	27
References	28

Preamble

The project “Green - Crew” has as its main goal to promote the alternative management of solid biowastes and to increase the associated employment, focusing on the management of the so called “green” solid wastes (e.g. wastes deriving from agricultural municipal activities, loppings, etc.) by utilizing a suitable aerobic digestion method, that of composting. The choice of composting as green management and valorization approach, in addition of being an effective biological and biodegradation process, it was based on the benefits that may offer via promoting the local and regional employment as well as the development of social cooperative enterprises.

In the establishment of European Union, the main target was to “...*promote throughout the Community a harmonious development of economic activities, a continuous and balanced expansion and increase in stability, an accelerated raising of the standard of living and closer relations between the States belonging to it*”. Although the economic growth of the community is still of high priority, the increasing necessity of **environment protection** has led to the conceptualization of **sustainable development** that dictates a balanced and sustainable economic and social growth. Since the mid 90’s we are facing a deep redefinition of both theory and practice of Local Development as a consequence of the reformulation of relationships among society, nature, economy and enterprises. For several years now there has been a progressive introduction of the concept of sustainability in the policies concerning the new European model of development.

The European Council adopted the EU Sustainable Development Strategy on June 2006. This is an overarching strategy for all EU policies which sets out how we can meet the needs of present generations without compromising the ability of future generations to meet their own needs. The Sustainable Development Strategy deals in an integrated way with economic, environmental and social issues and lists the following seven key challenges: → **climate change** and clean energy → sustainable transport → **sustainable consumption and production** → **conservation and management of natural resources** → **public health** → **social inclusion** → demography and migration → **global poverty**.

Sustainable development requires total capital - that is, economic capital, human and social capital and environmental capital - to be non-decreasing. “**Capital**” in this context refers both to the stock and to the quality of the resources - for example, the skills, health and knowledge of the population, and the quality of all the natural resources which are the lifeblood of modern culture.

Fourteen years after the concept of sustainable development - with its triple emphasis on social, economic and environmental dimensions of development - was popularized by the EU Commission, Europe faces major challenges across all these domains. Climate change has radically shifted the focus of environmental concerns, while global financial meltdown and

related crises of food and energy have extracted heavy social costs from those least able to bear those costs. [1] The limits and contradictions of current development models have thus been sharply exposed.

In this context, **green economy** has emerged as a prominent approach to addressing the human causes of global environmental and climate change through the transformation of the economy towards cleaner production and consumption processes. Widely defined as an approach "**that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities**", [2] the vision combines low carbon growth, resource efficiency, conservation, social inclusivity and poverty reduction, apparently offering "win-win opportunities to improve the integration of economic development with environmental sustainability". [3]

The impetus towards creating a European green economy comes from the widespread consensus among the scientific community of the dangers posed by greenhouse gases and the depletion of natural resources. These concerns are reflected in several international agreements, notably the Kyoto accord and, prompted the EU, by agreement with the Member States, to impose targets on sustainability. Climate change and environmental degradation are jeopardizing livelihoods and future sustainability in many areas of economic activity around the world. Alongside other drivers of change such as globalization and rapid technological change, they are causing **important shifts in labor markets** and skills needs. Public policies and enterprise strategies in many areas follow calls for innovative, clean and greener economies. Availability of skills for green jobs plays a crucial role in triggering change and facilitating just and timely transitions. The shift towards greening the economy will require the second greatest economic transformation after the industrial revolution. **We have not paid enough attention to the social dimension of sustainable development: its implications for employment, training and decent work. There are several links between education, training, employment and environment policies.** Green sectors will require new jobs, but they will also need to redefine many existing job profiles. The demand for new related skills will also rise in most occupations. To meet this challenge, education and training systems will need to supply a well-trained, highly skilled labor force. Training and guidance services that steer people towards jobs in growing sectors should focus on skills related to energy efficiency and renewable energy implementation. Putting in place the right training programmes for employees in declining sectors will help European economies redeploy workers who are difficult to place. A well-trained and environmentally aware workforce will also be more innovative in improving resource efficiency. To achieve this, we need comprehensive lifelong learning strategies and training systems that integrate sustainable development and ensure that the right skills are supplied.

The sustainable development agenda is complex and calls for many types of actions including agreements at many different levels, from global downwards, which set rules and targets to inform the actions of individuals and a wide array of formal and informal organizations and

networks. The outcomes of agreements and these actions can have considerable implications for the skills agenda which needs to evolve in response to these changes. As important, we need to ensure that society has the ability to address and agree how to proceed in the face of considerable differences in interests, values, development levels and perspectives between nations and between different stakeholders at all levels of society. The context in assessing whether any particular course of action is appropriate is also important. Many business corporations accept a notion of corporate social responsibility, but few would deny the pre-eminence of shareholder value as the driving force of their activities. As a result, sustainable development in its broadest sense often sits uncomfortably with private enterprise.

The skills associated with the emerging green economy can be categorized into **generic skills** and **specific skills**. The latter group is particularly relevant for the green economy, which creates a new skills paradigm that, in general, is more holistic in approach than the traditional one. The new paradigm places greater emphasis on design and working in multidisciplinary teams with a high degree of autonomy and responsibility. Projects often entail bringing together professionals from widely diverse backgrounds such as engineers, planners and architects with ecologists and archaeologists. This means that generic skills such as strategic leadership and adaptability will be important in the green economy. Good knowledge of the sciences, including engineering, environmental and biological, is a general feature of many of the skill sets required by the emerging green economy.

In the recent decade considerable interest and research have been devoted to understanding the determinants of green growth. However, an important and relevant issue seems to have escaped the attention of both economists and policy-makers: ultimately, green products and technologies are to be introduced into the marketplace by '**Green entrepreneurs**'. These are the economic actors who make it possible to turn ideas into a reality, by transforming prototypes into commercially viable products. However, the majority of policy mechanisms that have tried to enable green growth are aimed at identifying the technological innovations capable of mitigating the human impact on the environment and addressing global environmental issues - such as climate change, land degradation and loss of biodiversity. From a policy perspective, less attention has been paid to technology commercialization and to the need to subsidize the "public good" component of green entrepreneurship. Based on the review of such literature, the basic characteristics of green entrepreneurs are:

- **Green entrepreneurs** undertake new business opportunities and ventures, which usually involve a very high risk. The outcome of these business ventures is often unpredictable.
- **Green entrepreneurs** are intrinsically motivated. Their business activities have an overall positive effect on the natural environment and on economic sustainability, and consciously aim at insuring a more sustainable future.

The impact of the European environment policy on economic growth, competitiveness and employment is difficult to assess. Economic growth is usually paired to higher energy demand and stronger pressure on natural resources, as well as an increase in contamination and waste. On the other hand, it also increases environmental awareness of the public. The goal of the European Union is to reach a "sustainable" economic growth, that is, an economic growth that does not overconsume natural resources. So far, the European economy is not being sustainable yet.

Labor force is not optimally used, whereas environmental resources are being overexploited. Nevertheless, investments in environmental infrastructure clearly enhance employment and raise the standard of living. A major difficulty that arises when assessing employment creation is the number and complexity of factors affecting the net effects of environmental policy on employment. The continuity of the investments in the environment, the time span of environmental strategies and the philosophy behind the investment (long-term prevention versus last-minute compliance) affect the quality and duration of employment. Economic factors also affecting are the design of taxes and fees related to the environment (i.e. waste treatment levies), the financing -private or state-run- of the investments and the economic situation of the moment. In addition, labor force availability, import / export ratios and competitiveness in the market will also influence employment duration.

1 The Municipal Solid Waste Management & Green Economy

Solid waste management (SWM) refers to all activities and actions required to manage waste from its inception to its final disposal. While SWM is challenging, it also has the capacity to protect the environment, improve societies' quality of life and contribute to the economy as a whole. SWM varies among countries and regions, and is considered one of the most important municipal services for a city to protect the environment, public health, and aesthetic character. Improper solid waste management contributes to air pollution, surface and groundwater contamination and public health challenges.

Municipal solid waste (MSW) management is commonly the largest single budget item for communities, and this sector is often one of the largest employers as well. Thus, it is imperative to move towards a green economy in the solid waste sector by prioritising waste avoidance, minimisation and promoting the "Three R's" (Reuse, Recycle, and Recover). In addition, moving this important sector towards responsible stewardship will contribute to the main targets of the Sustainable Development Goals (SDGs): end poverty, promote prosperity and well-being for all, protect the environment and address climate change.

The document released by the UN, titled: "**Transforming our world: the 2030 Agenda for Sustainable Development**", has clearly stated that managing the solid waste sector has the potential to contribute to job creation, mitigate environmental and health impacts and improve the whole nation's economy.

This leads to "**greening**" the solid waste. Greening the MSW sector will contribute to achieving the Sustainable Development Goals (SDGs), especially the following out of the announced 17 goals:

- **Goal 1** - No Poverty;
- **Goal 3** - Good Health and Well-Being;
- **Goal 7** - Affordable and Clean Energy;
- **Goal 8** - Decent Work and Economic Growth;
- **Goal 11** - Sustainable Cities and Communities;
- **Goal 12** - Ensure Sustainable Consumption and Production Patterns;
- **Goal 13** - Climate Action by mitigating the GHGs; and
- **Goal 17** - Global Partnership for Sustainable Development by addressing the needs of the developing countries through non-discriminatory international funds (i.e. international donors' involvement).

Greening the solid waste sector has the potential to make significant contributions to the SDGs and green growth through reduction of waste, conservation and efficient use of material and energy, lower emissions, protection of human health and creation of jobs and employment opportunities.



Figure 1: General Waste Hierarchy According to EU Waste Framework Directive. [4]

Greening the solid waste sector could contribute to the following goals and targets of the SDGs:

No Poverty (Goal 1): by achieving full and productive employment and decent work for all MSW sector workers, including women and young people.

Good Health and Well-Being (Goal 3) and Decent Work and Economic Growth (Goal 8): by improving the labour conditions and working environment for workers in the MSW sector. In addition, proper waste management leads to healthy water and food, which in turn enhances the health of human beings.

Affordable and Clean Energy (Goal 7) and Sustainable Cities and Communities (Goal 11): by integrating the principles of sustainable development into country's policies and programs. Greening the MSW sector will also reverse the loss of environmental resources by following the solid waste hierarchy and encouraging the concept of the three R's: Reuse, Recycle, and Recover.

Responsible Consumption and Production Patterns (Goal 12): by substantially reducing waste generation through prevention, reduction, recycling and reuse.

Climate Action (Goal 13): by taking actions to reduce GHGs in the solid waste sector and its impacts.

Partnership for the Goals (Goal 17): by providing international funding, new technologies and information & communications to private and governmental sectors in developing countries.

1.1 Detecting the opportunities for social entrepreneurship and employment of the MSW sector

Greening the solid waste sector will provide major benefits to societies and will significantly contribute to the indirect economic indicators in terms of employment generation, GHG emission reduction and its associated health benefits, enabling energy production, and protecting human health.

“Green Economy” is based on the model of sustainable development and the principles of ecological economics. “Green Economy” has no internationally agreed definition, but the UNEP interpretation is widely used: “an economy that results in improved human well-being and reduced inequalities over the long term, while not exposing future generations to significant environmental risks and ecological scarcities”. [5]

Greening the solid waste sector will require a shift from the conventional solid waste management practices (*which focus mainly on protecting human health*) to the promotion of waste avoidance reduction, reuse, recycling and recovery, which can better protect human health while **also creating economic activity** and addressing global resource depletion.

This shift can be achieved through the application of **sustainable** and **integrated** solid waste management approaches that create job opportunities, generate energy and other by-products for beneficial use and improve the quality of life and health, which increases the value of physical assets.

Investments in solid waste management can enrich the economy by introducing new services, products and systems in other sectors, including industry, agriculture, manufacturing, construction, transportation and processing. Modern investment opportunities are in recycling, composting, transportation and energy production. [6]

Sustainable and integrated SWM (SISWM) or Green SWM [7] is as it is stated at:

- essential part of **successful local governance**
- emphasises **stakeholder participation and involvement**
- emphasises **occupational health and safety**
- provides **economic service delivery**
- guarantees **cost recovery**
- is performed in an **environmental friendly manner** that **minimises** resource use and **maximises** resource recovery
- contributes to **job creation** in the sector itself and encourages services and products in other sectors and industries
- helps **reduce the financial pressure on governments**

1.2 Employment generation as a benefit of “greening” the Solid Waste Sector

Greening the waste sector and following an appropriate MSW management approach leads to employment generation where more employees will be required to successfully maintain a new management system. The new job roles generated by greening the waste sector will bring about a more skilled pool of labor that is considered a value added as well, especially for developing countries. It is obvious that, moving up in the waste hierarchy, more jobs can be created. In addition, new sectors have emerged, such as GIS / IT enabled services. More job creation is maintained through scavenging in developing countries. The lack of adequate MSW collection and separation in developing countries gives good opportunities for scavengers (informal sector) to be engaged in such business. This creates a large need for informal scavengers and offers more income among the poor. This might help to eradicate extreme poverty and hunger as a goal of the SDGs. Activities related to MSW management vary widely and offer direct and indirect roles, as depicted in the following diagram.



Collectors

Organizations which pick up or transfer materials through curbside, bulky collection and / or commercial onsite collection of recyclable material. Include private, local authority and third sector organization.



Brokers

Businesses that purchase recyclable commodities (other than end users or processors) for resale. Both collectors and processors may use brokers to sell recyclable materials to end users.



Processors

Businesses that bale, crush, pelletize, compost, de-manufacture or otherwise change the form of the recyclable material for sale to an intermediate market or end manufacturer, including materials recovery facilities, scrap metal dealers.



End Users

Businesses that use recyclable materials as feedstock in the production of a new product. That includes paper, steel and aluminum mills but not companies which generate recyclable materials internally and reuse these materials.



Re-manufacturers

Business that remanufacture or reuse recyclable materials such as: furniture, white goods, computers and electronic appliances; used motor vehicle parts, tires, wood (e.g. pallet rebuilders). This category also includes retailers that sell used merchandise (e.g. charity shops)



Recycling Equipment

Business that manufacture equipment used solely for the purpose of collection and/ or processing of recyclable materials for recovery and reuse.

1.3 Skills for the green economy: towards a new concept of education and training

One of the major challenges in the green economy and its social impacts is to provide a practical evaluation of quantitative and qualitative factors associated with green jobs. More particularly to provide information about the skills needed in the labor market to achieve a better match between supply and demand. The need to develop skills for employment in the green economy is widely acknowledged at an international level, as shown by the reports issued by the European Commission, the UNEP, [8] and the OECD. [9]

A critical aspect of the issue and one that should be given much consideration in E.U. is the harmonization between the education and training system and the green labor market. E.U. should also focus on the strategic role of the social dialogue and the industrial relations in providing innovative placement services. The nowadays raising policies on tackling the climate change is expected to have two main consequences in terms of skills development. Policymakers will come under pressure to develop new policies and to assess the skills needs of the labor market, as well as the effects of environmental policies on employment. [10]

Green skills may be regarded as generic, as argued by the OECD, since they are difficult to define and acquire, but at the same time, they are essential, [11] considering in particular the concept of sustainability, its implementation in management and production, an awareness of innovative technology and standards and green manufacturing processes, as well as sustainable procurement, which has been promoted by the European Commission by means of a specific programme. [12]

Soft skills refer to a range of skills, such as the ability to ensure compliance with safety standards during production; a willingness to change jobs; team working skills; the ability to strengthen motivation in the workplace, to raise awareness of environmental issues, to carry out a product life-cycle analysis, and to adopt environmentally friendly technology; as well as the ability to communicate and to sell goods and services within the eco-business. More generally, those taking up new occupations in green employment require various kinds of knowledge, which should include an awareness of the legal provisions and instruments dealing with environmental issues, and the ability to determine resource availability on the basis of the sector and the geographic area.

Furthermore, depending on the economic background, further skills should be gained aimed at ensuring and managing sustainable development and becoming aware of the processes associated with sustainability, in economic, environmental, political terms. [13]

According to a survey carried out by CEDEFOP, [14] skills in the green economy will be characterized by their interdisciplinary nature, moving beyond a particular position or sector. Communication and problem solving in relation to environmental issues, as well as the use of appropriate technology, are key instruments for employees in the green economy.

Communication skills play a significant role in the green economy, as there will be a growing need for professionals who are able to explain to managers, enterprises, and consumers how to implement and benefit from new technologies, on the basis of a process known as cascade communication. Researchers from CEDEFOP and ILO [15] argue that green skills have given rise to a new concept that moves beyond the traditional distinction between 'basic' and 'transversal' competences. The new approach highlights the need for a wealth of knowledge that combines traditional and new skills, consisting of 'shades of green'. [16] While some experts point out the innovative nature of green skills, such as the assessment of environmental impact and knowledge of environmental protection laws, the majority maintain that these are existing skills that have been adapted to sustainability and new trends in the labour market, to construct a new society based on information and knowledge.

2. Green Entrepreneurship & Green Economy

Entrepreneurs are active people who envisage new business opportunities and ventures by taking risks and converting their ideas into commercial reality. Entrepreneurs introduce innovation, adoption and new ideas to the economy as well to the society. The entrepreneurs are the group of people in each society that promote change in the economic and business environment and overtake the old ways of operating.

It was not until 1990s that the studies on green entrepreneurship emerged. Bennett (1991), [17] Berle (1991) [18] and Blue (1990), [19] first adopted the notions 'environmental entrepreneur', 'green entrepreneur', 'eco-entrepreneur' and 'ecopreneur' in their studies. Based on the review of such literature, the basic characteristics of green entrepreneurs are:

- Green entrepreneurs undertake new business opportunities and ventures, which usually involve a very high risk. The outcome of these business ventures is often unpredictable.
- Green entrepreneurs are intrinsically motivated. Their business activities have an overall positive effect on the natural environment and on economic sustainability, and consciously aim at insuring a more sustainable future.

However, in modern era green entrepreneurs often struggle to survive, due to an unstable commitment from the public sector, whose support is being easily overturned by everyday changes in politics and lobbying. There are three fundamental issues that concern the uprising entrepreneurship trend towards the Green economy:

- **Firstly** there is a concern that the need to further advocate a more green economy could be used as an excuse for a new style of protectionism and for imposing a series of conditionalities on developing countries.
- **Secondly** the general tend to assume that that green entrepreneurship and green innovation are mainly about the production and trade of environmentally friendly but expensive products to affluent consumers in developed countries.
- **Thirdly**, even though niche markets for green products contribute to more sustainable consumption and production patterns, they will not lead to a global transformation towards a green economy until they reach the masses.

2.1 Stimulating green innovation through a social lens

Very often the concept of “green innovation” nowadays is monopolized by the renewable energy sector (e.g. wind power and fuel cells). But it is getting more and more evident that the shift to a post-carbon economy depends on much more than technological improvements in energy related technologies. It requires a transition in several levels from innovation in lifestyle to innovation in investment and governance. [20] Additionally, non-technological innovations (like bio-wastes composting) are at least as relevant, considering the case of new business models that develop new organizational approaches.

Many of the reports on the green economy today are skeptical about the ability of the market to address environmental concerns and to provide enough stimuli to incentivize green innovations (UNEP 2011, [21] FAO 2011, [22] and OECD 2011a, [23]). Successful green innovators had an intrinsic motivation to improve through experimentation and, at the same time, were able to create successful businesses. They also invested most of their profits again in the improvement of their green product or technology. By doing that, they created large social and environmental welfare gains while ensuring the commercial viability of their business. [24]

Today, green business is creating new economic opportunities for both multinational corporations and small and medium-size enterprises (SMEs). The private sector, stimulating economic growth and development, is increasingly playing an essential role in bringing solutions to global sustainability challenges. Green enterprises are increasingly successful in proving to shareholders and stakeholders that sustainability is not just a cost but rather an opportunity to increase revenues and customer loyalty while protecting the environment. To reinforce the business core for sustainability and promote a culture of innovation within all staff divisions, all kinds of companies have been looking at sustainability comprehensively, taking steps in the direction of water conservation, carbon neutrality, solid waste reduction, post-consumption recycling, while measuring rigorously the costs and benefits of each business unit. In some cases, companies have also managed to leverage governments to improve standards, education and labor skills. To this regard, an increasing number of highly profitable businesses from the developing world are turning eco-consciousness in a competitive advantage.

Therefore, while it seems clear that sustainable **economic changes need to come from the bottom up**, the transition to **a green economy requires the simultaneous integration of top down incentives-regulations and bottom up solutions**. The holistic vision which underpins the capability of innovation to create new ways and combinations, as well as the interdependency between the economic, social and environmental aspects of development (“the three strands of sustainable development”), and the economy itself, characterized by globally connected and cross-cutting value chains, **require combined efforts from the public and private sectors**.

It is widely accepted that integrated governance and a conducive institutional framework reduces the uncertainties for green entrepreneurs and allows all actors to deliver on their shared responsibilities and to address the missing links within the marketplace.

The OECD report “Fostering Innovation for Green Growth” contains some important policy recommendations. Governments should introduce adequate regulatory incentives to strengthen markets for green innovation, and a well-functioning Intellectual Property Rights (IPR) system to foster private sector investment and diffusion of green innovation. They should also promote more entrepreneurship in the private sector and enhance public sector support for R & D to facilitate sustainable technological change (OECD 2011b). [25] The report also notes that existing production technology and consumer behaviors can only be expected to produce positive outcomes for the economy and the environment if innovation is able to decouple growth from natural capital depletion.

Recently many countries, in their transition to a low- carbon economy, have been **adopting strategies and policies to develop new opportunities and to attract new green investments**. To this regard very diverse economic entities have emphasized the role that the public sector can play to influence markets towards sustainable paths without increasing pressure on taxpayers or altering competition among different industries. Although additional research is needed to understand how to create a more conducive environment for sustainable development and to explore the potential of sovereign wealth funds, governments are increasingly encouraging public-private partnerships to attract green investments and creating competitive locations for green foreign direct investments.

In order to perform the transition to a fair green economy we can highlight the following social dimensions that should be included:

- Adequate knowledge
- Belief systems & values of different societal groups
- Type of existing social structures
- Institutions and market relations

A meaningful change towards green economy must have a clearly fair character for all social groups that constitute the local / regional communities. This transition requires the policies, the institutions, the public participation and innovation to come together in ways that are highly complementary and synergistic. We can note several such complementarities such as:

- cooperation and technological innovation in rural activities
- decentralization, incentives and active citizenship
- cooperative organization of SME's
- public – private partnerships and collective or community organizing

The joining-up of numbers of policy tools with participatory processes and coalitions of multiple actors often emerges as a determinant of initiatives that are conducive to fair and sustainable

development. Collaborative governance can facilitate resource mobilization, the pooling of competencies, and ensuring complementarities and synergies that otherwise would not exist.

European Union has proven up to now how governance arrangements can facilitate collaboration not only of multiple actors (state, market, civil society and community) but also at multiple scales (international, regional, national, subnational and local). Ongoing contestation within governance is also important to ensure that voice translates into influence, and that consultative processes serve to democratize policy making. Taking into consideration all the previous argument we can only point to the importance of the empowerment and organization of traditionally disadvantaged social actors. An aspired future green society will be depended upon the capacity of such groups to organize collectively, engage in advocacy and bargaining, and be part of broader coalitions for change.

Ultimately, public policies need to be rooted in a strong social contract between a state and its citizens, creating solidarity and a consensus for change across social and economic groups. Addressing global environmental challenges in a globalized world will require a new environmental-social contract that extends from local and national levels to the global arena; it will need to be associated with stronger mechanisms of global social and environmental governance over the management and provision of global public goods. Such a contract will need to be grounded in rights of citizenship or entitlements linked to employment or residence; as well as in principles of universalism, solidarity and intergenerational equity. This in turn calls for a focus not just on policies and outcomes, but on the institutional arrangements and processes for achieving them. Key in this regard is a focus on the agency, empowerment and accountability of social actors - states, business, civil society, communities and individuals - in bringing about the structural and institutional changes necessary for a transformation to sustainable development.

2.2 Identifying the Barriers for Realizing a turn for a Greener Economy on the MSW sector at the projects area

The issue that is creating most of the barriers towards greening the waste sector is the limited financial capacities to cope with the growing demand for good service as a consequence of fast urbanisation. Countries such as both Greece & Bulgaria, face the most acute challenges with their MSW systems. It is evident that in countries that the MSW sector is better financed and equipped with the appropriate regulatory and institutional capacity the trend is generally to a constant improvement of the efficiency of the MSW system, and movement towards a more financially and environmentally sustainable system.

In recent years, attention has focused on the limitations of waste management investments and the identification of more effective means of technology transfer. The principal barriers within countries that affect greening the solid waste sector include (IPCC, 2000): [26]

Limited financing: The development of basic infrastructure to collect and treat MSW is expensive. It must be noted that regions like the ones that the project “Green-Crew” is implemented which are categorized among the poorest of the respective countries but also show a fast rate of development, the local governments often fail or delay on generating the investment required. In addition the availability of private financing on these types of projects.

Limited Institutional Capabilities: Well-functioning waste management systems require advanced & mature institutional frameworks to ensure that waste is collected as expected, treatment and disposal facilities are operated and maintained effectively, and revenues are collected. In several members of the E.U. as well as in the case of Greece & Bulgaria the phenomena of struggling to catch up with the regulations imposed by the E.U. about wastes causes serious delays to the implementation of effective management systems at local & regional level.

Need for Community-society Involvement: Ultimately, the success of a waste management system depends upon the willingness of the public to use it. Multiple late reviews of waste management projects have indicated that sustainability and performance improve to the degree that end-users are involved in the design and financing of the project. Public-Private Partnership (PPP) is considered to be the best approach to infuse private sector capital. Weak regulatory frameworks and poor institutional capacities deter private sector investors. In addition, the largely informal nature of the sector, undermines much of the work to establish safe and modern waste management systems. Mitigation projects can be successfully integrated into larger waste management efforts provided they are able to meet the needs and priorities of end-users, decision-makers, and financial supporters.

In order to overcome these barriers projects like the “Green – Crew” are considered to have a highly positive effect on regional communities by providing them knowledge and stewardship and multiplying their efforts on introducing new management schemes on MSW.

The following figure 2 shows the list of barriers and challenges that undermine the greening of the MSW management processes in regional areas like the ones that the “Green- Crew” project covers.

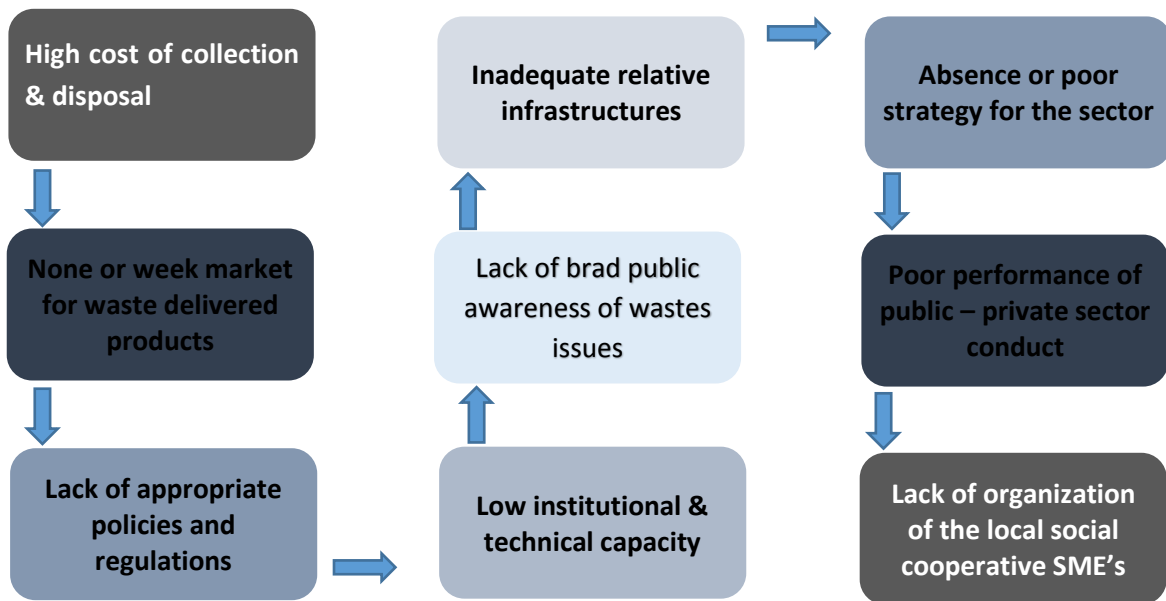


Figure 2: Barriers for greening the Municipal Solid Waste sector [27]

3. The Project “Green – Crew” and its approach for greening the wastes sector

The aim of the “Green – Crew” project is to promote “green” employment in the management of biowastes at the Greece and Bulgaria cross-border regions and to generate a high socio-economic impact along with increased environmental protection and circular economy awareness.

The projects main objectives are:

- the creation of new employment positions *via* a completed management of “green” biowastes,
- the creation of new employment positions *via* a social cooperative enterprise, a new institution that seeks collective profit and is of service of the general social interests,
- the growth of a concrete administrative practice, including harvest practices and investigation of use of the collected biomass; this administrative practice initially will be developed in level of the Municipality but can be extended at a Regional level,
- informing the involved institutions and producers of the Regions (farmers, simple citizens) about the possibility of developing a new economic activity with double profit (for the environment and for the private individuals),

To achieve the above goals the project scheduled and implemented among others the following specific actions to the implementation area:

WP2: Communication and Dissemination

1. Two final conferences one in each country designed to attract wide public participation
2. Creation of a projects specific website for utilizing the internet’s capacity to disseminate the information to the general public
3. Creation of an array of classic information material like posters, leaflets articles etc.

WP3: Exploration of the potent of the social contribution of bio-waste utilization

1. Elaboration of a SWOT analysis focused on the project implementation areas on all prevailing issues around biowastes production & management as well as the wider social & economic status
2. Development of a specific manual containing all necessary guides for establishing social cooperative enterprises for biowastes handling.

3. A thorough report for pinpointing the needs for training and skills development for the target groups of the project.
4. Utilisation of smart education tools in order to maximise information flow and capitalization to the trainees.
5. A “white week” training seminar in each participating region with targeted courses.

WP4: Recycling of organic waste

1. Building capacity for SME’s of the Social Cooperative Enterprise type to be involved to biowastes sector
2. Interventions and capacity building on two composting plants.
3. Quality assessment and analysis of the various biowaste feedstocks and of the produced compost.
4. Development of market strategy for compost commercialization

3.1 The “Green – Crew” enabling conditions for greening the wastes management at the project area – Social impact assessment indicators

The project created a number of essential conditions to enable the participating cross-border areas to move towards the desired direction, such as stakeholder involvement and an enabling environment, aiming to maximize the socio-economic impact and environmental benefits. The project has utilised a broad perspective and some powerful ideas that have emerged from a review of the policies and actions that have proven successful in promoting a green economic transition. In this section, we provide an overview of the importance of incorporating the social aspects in the waste management systems. It must be clearly noted that social aspects are important but very difficult to assess. The use of indicators is seen as an attempt to cover the most important social elements in play. The indicators for assessment of the “Green-Crew” project social impacts were developed in co-operation with experts involved in waste management and are based on empirical level of importance. It must also be pointed out that the indicators are not to be seen as true indicators of social sustainability, but as a measuring devise assigned to highlight common social parameters in correlation to the project implementation. In our case the indicators for assessing the impact are:

1. **Consultation among experts and public participation:** Engaging stakeholders through consultation, public awareness, participation and communication;
2. **Policy Enforcement:** Establishing sound knowledge of the relative legislative frameworks;

3. **Economic instruments:** Performing economic incentives / disincentives and promoting green investment and innovation;
4. **Costing and Financing:** Prioritising public and private sector investment and spending in areas that stimulate the greening of the waste sector;
5. **Human Resource Development:** Investing in capacity building and training;
6. **Innovation:** Stimulating technological and social innovation to find innovative approaches to recovering maximum social, economic and environmental benefit from waste

The enabling social-centered conditions that the project ‘Green - Crew’ adopted and advocated through its actions in order to make its own contribution to the effort of greening the MSW sector are synoptically displayed in Figure 3 below:

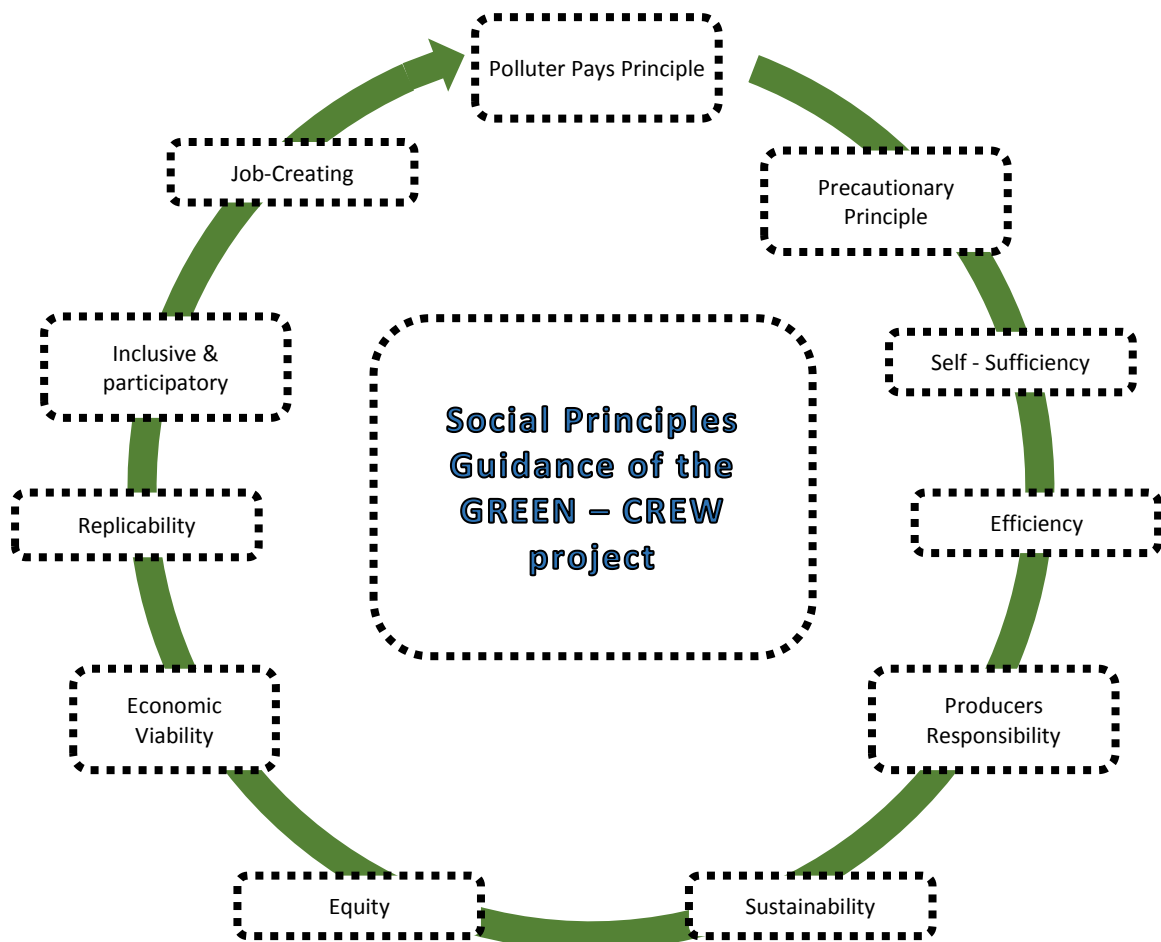


Figure 3: Towards Greening the MSW Sector [28]

3.2 Social Impact Assessment of the “Green – Crew” project to its implementation area

Impact assessment is generally defined as the prediction or estimation of the action’s effects. In relation to the continuous discussion on sustainable development there has been a noted tendency to question the term “progress”. There is need to determine the environmental but also the social consequences of certain activities. Environmental and social impact assessments have emerged as tools for planners and decision makers to minimise problems, maximise benefits and to involve the public and win their support concerning environmentally and socially appropriate development. Impact assessment is a process that blends administration, planning, analysis and public involvement in assessment prior to the taking of a decision. [29]

In impact assessment it is important to look at all options, both the negative and beneficial impacts and also to include the option of not undertaking any development. Therefore the current Impact assessment is done to forecast and evaluate the impacts of the implemented project.

Social Impact Assessment (S.I.A.) can be seen as assessing the social consequences likely to follow from specific policies and actions a-priori to development. Social impacts include all social and cultural consequences to human populations, also involving changes to norms, values and beliefs of individuals. This type of assessments are designed to understand and managing change, predict consequences, design strategies to minimise the social impacts, develop monitoring programs and implement mechanism to deal with unexpected impacts to occur.

The environmental problems involved in waste management are in fact societal problems as they are originated within the society and have a direct effect on the society. It could be argued that some of the treatment methods used in waste management, such as energy recovery and recycling will not solve the fundamental problems of waste creation and resource depletion. Nevertheless a proper waste management making use of these approaches greatly improve the environmental, economic and social situation, and by viewing waste as a resource and not as waste, a key step towards sustainability has been made.

Proper treatment methods, modern clean technology, high diversion and participation rates could work in agreement with the definition of sustainability related to waste as early presented by Daly (1996) [30]:

“Waste emissions should not exceed the renewable assimilation capacity of the

environment”

Meaning that the methods of recovering energy, reusing materials and treating organic waste, rather than landfilling, should be encouraged and set as a priority.

Sustainable waste management must incorporate all three aspects of sustainability, the environmental, economic and social. Shared responsibility is closely linked to the social factors of waste management. It must be implemented by a structure within the organisation that is legitimised by its citizens, in order to act in a consistent and common direction. It is a key to the success of the system.

3.3 Analysis and comments on the selected indicators for the “Green – Crew” project

In terms of sustainability, the sector of waste management has received much attention in its economic & environmental consequences. The equally important elements of social sustainability, although viewed as highly important, have been more difficult to assess and generally are more rarely discussed in modern literature.

Sustainability goals in the project’s implementation area, puts restrictions both externally, on the surrounding nature, and internally, on the structure of local society itself. Acting with a shared responsibility towards nature as well as current and future generations, requires a consistent, responsible and co-operative approach. Local society must have a structure that can be seen as legitimised by its citizens.

A common and widely accepted set of objectives for social sustainability are:

- Empowerment,
- Participation,
- Equity,
- Social cohesion and
- Institutional development.

These objectives are clearly found in the project “Green-Crew” and in its approach for waste management in the respective areas and indeed much of the estimations of this assessment emphasise the importance of the two-way dialogue, fairness and participation as factors determining the success of the waste management programmes.

The indicators measuring the social factors in this study are not sufficient to measure the social sustainability of waste management. Social sustainability involves much more than the Indicators discussed here and is more complex to measure. What has been assessed, and what

also has been the aim of the study, are certain crucial social elements integrated in the waste management programmes.

In order to have an effective practical applicability, the three concepts of sustainability need to be integrated and optimized. For waste management the social sustainability defines the driving forces to have a stable structure, be socially functioning and subject for improvements. An attempted definition of social sustainability in waste management is:

“Waste management must promote inclusion, cohesion and responsible local, regional and global citizenship. Through safe, just and acceptable participation and governance from citizens, businesses and the government”

The present analysis – based on empirical research across similar projects- highlights both the centrality of social issues in green economy debates and some of the profound challenges that policy makers have to confront in their efforts to craft transition pathways that are green, fair and regionally customized. The policy response that was selected through the “Green –Crew” project included:

- (i) Use of proper mechanisms for social protection and adaptation such as forms of **targeted assistance and training**.

Indeed the project included the so called “white week” training seminars that were targeted to people that had relative generic skills in the thematic of organic wastes and through the seminal they acquired specific skills that enable them to adapt in a greener bio-waste management.

The seminars that were elaborated by the project had a positive effect on strengthening the broad based participation of the local communities as well as local ownership over public policy making in SWM issues as well as understanding local civil regulations concerning SWM.

More over by the projects product of a **specific manual on how to develop social cooperatives dealing with composting of the bio-wastes** they acquired a valuable tool to their potential effort to **crate SME’s** on the sector. The positive outcome of these actions was the valorization of the knowledge and practices of the local communities, by providing proactive support for traditional livelihood practices that also achieve environmental and social justice.

- (ii) Implementation of actions that were designed to achieve the win – win scenario for the cross-border regions such as avocation of **green jobs** for local population and incentives for **green entrepreneurship** and widening of the **circular economy** related to primary sector.

The actions of the project that were dedicated to **capital investment** of **132,000.00 euros** on upgrading and capacity building on the two composting plants, as well as the action of the **quality assessment** of the produced compost had a clearly positive effect on employment **creation and subsidization of SME's** involved to bio-wastes management and transition of the primary sector of agriculture from a linear to a **circular functioning form**.

The projects actions that were oriented towards local composting plants acted as a positive effort in order to ensure an enabling financial, legal and market environment in which relationships between local government, private and community actors are constantly interrogated to ensure a **fairer balance of power**.

Another positive impact of the project was the active engagement of local resource users and intended beneficiaries in designing and implementing endeavors such as **creation of SME's** for bio-wastes composting in the form of **Social Cooperatives** in a bottom up approach manner thus avoiding the pitfalls of top-down external interventions. The project also promoted the spirit of **cooperative / collective organization** to the implementation area in issues of introduction and acceptance of new forms of SWM and **autonomous development**.

- (iii) The project exploited also a **transformative social policy** in order to drive **structural changes** to societies within the implementation area.

This was served by the well elaborated actions of the WP2 Communication & Dissemination and more specific by the creation of the specific website, the two open public conferences that were attended by 45 local people and the more classic but still valuable tools of leaflets, posters and other like printed materials. The group of 45 people were consisted of students, representatives of local Social Enterprises, municipal employees and other people interested to get involved / participate in Social Enterprises dealing with composting organic wastes.

Moreover the project by its original designed partnership involved in its actions 3 cross-border municipalities (Municipality of Serres, Municipality of Nestos, and Municipality of Blagoevgrad) as well as the Department of Chemistry of Aristotle University of Thessaloniki in its actions. The partnership scheme is ideal for promoting the much needed **transformation of social policy** that the local authorities must pursue regarding the goal of SWM and implementing **structural changes** to it from the start point: wastes production by civilians to its end point: economically viable and environmentally sustainable management. The project had a positive impact in building capacity to Local Authorities, and adding trust and public acceptance to the new introduced methods for wastes management by the valid input of a well-established institute like the Aristotle University that provided all necessary scientific justification to the new management

methods. To this purpose, the action of producing a report on physicochemical characteristics and quality of the various biowastes and the respective composts from the upgraded composting sites within the projects implementation area added an unquestionable and significant portion of trust to the promoted method.

The project also supported the local activism associated with existing social movements towards a greener management of wastes and provided the means to build local network of civil society organizations that are oriented to building a sustainable way of development to the cross-border region. This was served by the specific website that the project created for providing a pathway for information exchange on the topic.

It can be said that the project did well in the scope for meaningful change in attitude by bringing together policy, institutions and public participation in ways that were complementary and synergistic. The project has shown several such complementarities:

- cooperation and technological innovation,
- decentralization incentives and active citizenship,
- cooperative organization and government training,
- public - private partnerships and community organizing

Through its actions the “Green-Crew” project joined-up policy tools and participatory processes and coalitions of multiple social actors thus creating a determinant of bottom up initiatives that are conducive to fair and sustainable development.

The project through its dissemination strategy, further advanced the collaborative governance regarding SWM management to its implementation area leading to local resources mobilization, pooling of competencies, and ensuring complementarities and synergies that otherwise would not exist. Ongoing contestation within governance is also important to ensure that voice translates into influence, and that consultative processes serve to democratize—rather than simply legitimize — policy making. This points to the importance of the empowerment and organization of traditionally disadvantaged social actors.

3.4 Conclusions and highlights on the social impacts of the Green Crew project

Finally, the summarization of the social impacts that the project facilitated to its implementation area is as follows:

1. It created a platform where different stakeholders were able to meet and learn in collaboration both informally and formally. This type of platforms are very important to modern societies because they combine the strong points of the continuous educations that derive from both the inside and outside of the formal education system. Enhancement of public participation and consultation would be effective in advancing SWM practices.

2. It augmented a number of local Authorities (e.g. Local Governance) to ensure the development of comprehensive, clear environmental policies addressing municipal solid biowaste management. The involved local authorities in this manner validated their commitment to implement strategies towards green economy in the waste sector.
3. Disseminated to the regional cross-border area the updated EU policies and national / regional regulations relevant to the waste management. It focused on policies related to the market of reused/ recycled materials, land use policies, and also planning and regulations to set minimum safety standards that protect labor.
4. The project conducted a package of tools for enforcement and compliance: legal, economic, communication and outreach. In addition, it strengthened the capacity of local bodies that are mandated to provide SWM services to local citizens.
5. It served as a mechanism that provided financial & technical support to local incentives in the form of Social Cooperatives to encourage moving towards greening the solid waste sector.
6. It utilized those incentives to change behavior of local residents.
7. It accelerated innovation to meet the shared long-term SDGs through the contribution of technological innovation to fostering economic growth.

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