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SOCIAL AND ETHICAL CHALLENGES OF USING BIOMASS - A RENEWABLE ENERGY SOURCE

Theoretical articles

Keywords

*Social challenges,
Ethical challenges,
Renewable sources,
Biomass*

JEL Classification

Q24, Q34

Abstract

Biomass, along with other renewable energy sources (solar, wind power, hydropower, etc.) is the alternative energy to conventional energy sources. The need of alternative energy sources is given by the increase in energy demand associated with the reduction of conventional sources. They are supplemented by society efforts for reducing the global warming.

Thus the biomass use is enthusiastically received and supported by numerous development policies. Nevertheless, the use of biomass to obtain energy involves negative effects on society and also on the environment, generating concerns about the ethics of human actions.

All these concerns regarding the biomass use can be prevented and ameliorated by a legislative framework that integrates among the economic and environmental, social and ethical principles. Because without a set of ethical principles aimed at fairness between individuals, social responsibility and also intrinsic value of the biosphere, challenges and problems generated by the use of renewable resources will be intensified.

INTRODUCTION

The EU policy regarding the use of biomass as a renewable energy source is shaped by the existence of a Strategy on renewable energy sources and a Plan of Action for biomass, which outlines development guidelines also emphasizing the need to use this renewable resource of energy, to create stable policy frameworks and improve, at community level the planning systems and the electricity grid access (Drăgoi, 2014). The use of biomass is regarded with enthusiasm and supported by numerous development policies. But what are the challenges and the effects resulting from its use? Can someone be affected?

This paper will analyze possible ethical challenges arising from the use of biomass on society and the environment. The analysis will consider all parties involved accepting them as morally important. Among the possible effects on society resulting from the use of biomass there are: the food security, the human rights, the respect for minorities, the right to property, the visual impact (Thevathasan et al., 2014). The possible negative effects upon the environment may be an imbalance of ecosystems, species extinction, changes in natural habitat and a compromised natural appearance.

In this context, in order to speak about a sustainable development we should try to prevent and to improve (ameliorate) these effects. Thus human actions should be associated with responsibility observing ethical principles such as justice, equality and welfare.

In order to speak about real responsibility of our actions we should consider also the environmental values. The environmental values are supported by anthropocentric and non-anthropocentric arguments. From an anthropocentric standpoint, nature deserves moral consideration because it is important for people and from a non-anthropocentric standpoint nature deserves moral consideration because it has intrinsic value (Kortenkamp & Moore, 2001).

In the last section, there are presented a few technical issues, because the technoethics can be considered a reference field. The applicability of this field can make the connection between human action and moral responsibility.

GENERAL ASPECTS

The biomass is the most abundant renewable resource on the planet. It is the first form of energy used by humans with the discovery of fire (www.arhiconoradea.ro/Info%20Studenti/.../1%20Biomasa.pdf). Today, biomass is among the main renewable sources used for the production of

“green energy”. As a renewable energy source, it has many advantages; it can be used both to generate electricity and heat (Drăgoi, 2015) and also for the bio-fuel production.

The use of renewable inexhaustible sources, such as water, wind, sunlight, wave movements or the biomass for producing electricity but also for heating and bio-fuels utilized in transport was one of the solutions prepared and implemented gradually worldwide and European, to remove and mitigate threats that have emerged during the early 1970s regarding the limited conventional energy resources depletion (Câmpeanu & Pencea, 2014), natural gas, coal, oil.

ARGUMENTS SUPPORTING THE USE OF BIOMASS AS AN ENERGY SOURCE

The exploitation of renewable energy resources, including the biomass arises from the need to prevent the *depletion of conventional energy resources*. Thus the development of new energy conversion technologies have a more accelerated dynamic after 1973, when the global economy was shaken by the first oil shock (Câmpeanu & Pencea, 2014). In this context, it can be considered that the main argument which supports the use of renewable energy is an economic argument. Among the economic arguments there are *the energy security and reducing the dependence on import, the economic prosperity and the increase of energy competitiveness* (Câmpeanu & Pencea, 2014).

Another argument which besides the supporting of the development of world economy ensures also the environmental protection is the fight for *climate change mitigation*.

Also, it is estimated that, alongside solar and wind energy, biomass has the ability to play a fundamental role in terms of building a competitive secure and sustainable European energy system (European Commission, 2014).

ETHICAL CHALLENGES ON SOCIETY

It can be noticed that most of the arguments which support the use of renewable energy sources are economic in nature; moreover the fact which stimulated the interest in finding alternative sources to conventional sources was the oil crisis during the years 1973-1981, and the global financial economic crisis during the years 2007-2010. Although the economic benefits are major, for investors in particular, when we use these resources we should take into account the effects generated upon the society and the environment in order to speak about a sustainable development impact (Thevathasan et al., 2014).

Among the possible effects on society resulting from the use of biomass there are: the food security, the human rights, the respect showed to minorities, the right to property and the visual impact (Thevathasan et al., 2014). In a changing society, where the economic prosperity, the technological innovation and the growing demand for knowledge are the main motivations, appears the need of a moral thinking. Also amplifies the importance given to the ethics as a guarantee of inducing moral, fair and accountable behaviors for all the participants and social actors in order to grow the chances of solving crisis situations and eliminate risk factors, or at least their suspension (Maxim, 2012).

Today biomass is regarded with enthusiasm and is considered to be one of the best solutions to satisfy the energy needs and to provide sustainable economic development. However, its use should be subject to systematic moral value judgments. Biomass raises ethical issues, in particular, by the method through which it is obtained. Thus, intensive energy crops both in agriculture and forestry can stretch over large surfaces, eliminating areas for feeding and thus putting the food security in grave danger.

For example, in the UK the road traffic utilizes 37.6 million petroleum products per year. The most productive oilseed crop in the country is rape with about 3.5 tons per hectare. AF one tone of grain rape provides 415 kg of biogas, 1.45 tons of fuel per hectare. In order to make all the cars go on biogas 25.9 million hectares of rapeseed would be required, but Great Britain has only 5.7 million. Thus, to achieve the modest target of the European Union, almost all British farmland must be utilized to the purpose of growing rapeseed crops. If the same phenomenon is calculated on a European scale, we find that the effect on food supply would be catastrophic. And if the experience will expand on a global scale, the main fertile land on Earth will end up being used to produce bio-fuels for cars and food for people would fall in second (www.arhiconoradea.ro/Info%20Studenti/.../1%20Biomasa.pdf).

All this happens, given that in some areas of the world the need for food is bigger than the need for fuel. Moreover, in the same time with the biofuel production, global food price increased, generating, especially in poor countries, hunger and malnutrition (Oceransky, 2007).

In this context, certain ethical principles such as justice, equality, and good are required to be respected. It is obvious that we need a theory of good to show us exactly how to fulfill our duty to do well to our fellow men (Goodin, 2006). According to the utilitarian doctrine an action is considered to be good if it brings benefits or provides the greatest happiness for the greatest number of people (Dicționar Filosofic, 1978). So,

the use of biomass to obtain energy or bio-fuels can be useful to a large number of investors, materialized by obtaining profit; it can be considered a solution to reduce emissions of greenhouse gases, or it can provide an alternative to hydrocarbons preventing their exhaustion. However, it is not very difficult to notice that in another geographical area, our neighbors do not need electricity and fuel, instead they need food to survive. What should we do with such a reality? How should we act so that human rights are not violated? Can the right to food and survival be considered an absolute right?

If there are indeed absolute rights, they should be very few in number: maybe the rights to life and liberty (Almond, 2006). Even though the absolute right of individuals to life can stand in the way of socio-economic progress, it can not be ignored. Thus, all actions, even those directed towards progress and development must ensure the basic needs for all inhabitants of the planet, even if the gain of one part means the loss of another one. It would be immoral to put economic prosperity of the developed countries, which are enjoying a state of well being and happiness above the basic needs of individuals in poor countries. Moreover, according to the principle of equality, human actions should satisfy the requirements to *achieve the same social situation for all members of the society* (Dicționar Filosofic, 1978).

From another perspective, using the lands for energy crops by *wealthy businessmen or the new agricultural techniques may exclude simple farmers from the economic process* (Dower, 2006) that can lead to property infringement. A good example showing that intensive energy crops can lead to infringement of property is presented in a report by the Friends of the Earth Association in 2005.

They claim that in Malaysia, 87% of desertification is caused by palm plantation development. In Sumatra and Borneo at 4 million hectares of forest have been converted into palm plantations. The Malaysians intend to deforest 6 more millions of hectares and the Indonesians 16.5 more millions. Thousands of indigenous people have been expelled from their land because of this. (www.arhiconoradea.ro/Info%20Studenti/.../1%20Biomasa.pdf)

Also, in terms of aesthetics, energy crops significantly change the landscape of the area, having a negative impact on the individual. Besides its utilitarian value, the environment can also provide an intrinsic value. For local populations, both the natural and landscape diversity can have some aesthetic, historical, cultural or even sentimental significance. The natural beauty of the environment can be considered a good. *Beautiful alongside graceful and cute, or sublime, wonderful or gorgeous and similar expressions is an adjective*

that we often use to indicate something that we like. In this sense, it seems that what is beautiful coincide with what is good (Eco, 2007).

Human actions should have a moral conscience of responsibility as basis (Maxim, 2012), so as not to infringe individual rights of access to goods, services and values offered by the society and the natural environment.

ETHICAL CHALLENGES CONCERNING THE NATURAL ENVIRONMENT

The biomass has the ability to play a fundamental role in terms of building a secure and sustainable European energy system (Drăgoi, 2014). Furthermore, it is considered to be a clean energy alternative, and a measure to reduce greenhouse gas emissions. However, the objectives set by the European Union involve the use of large quantities of biomass. Currently, forestry and agriculture in the EU are the main sources of biomass at Community level (Drăgoi, 2014). Which means that in order to satisfy demands, intensive energy crops must be implemented. These crops can generate, besides the social impact, a negative impact upon the natural environment. The effects on the environment can be as follows: species extinction, disturbance of ecosystems, changes in natural habitats, compromising the natural appearance.

Can the balance of natural ecosystems be considered important? Can the environment be valuable in moral terms? Does it matter that these intensive energy crops can cause the extinction of species of plants and animals? Does it matter that the natural habitats of species will be changed? Certainly, from the economic standpoint arguments will be found to support these actions. But only economic arguments cannot achieve a fair and favorable evaluation.

An ecologist, for example, will want to know what the effects on the environment are *because he seeks its protection or believes that the destruction of wildlife is morally wrong* (Elliot, 2006). The environmental ethics deals about the moral care for nature and for the environment. The environmental ethics is defined as systematic thinking upon the actions of mankind towards nature and / or environment and the question which arises whether that action is ultimately good/bad (Paslack, 2010). Therefore, any intervention designed to alter the environment should be subject to assessment so as to be given the value of each factor involved. The importance of the environment can be supported by both anthropocentric arguments and non-anthropocentric arguments.

The anthropocentric approach creates a human-centered environmental ethics, which admits that the environment has value only in relation to man.

In an anthropocentric vision, animals, plants, ecosystems and the whole nature have only a utilitarian value to human beings and their interests (Paslack, 2010). Such ethics forces us to assess and calculate the effects that obtaining of biomass by creating intensive crops could have on the happiness or unhappiness of human beings.

We might probably notice that some people might be sensitive to the suffering of animals, some might be saddened by the disappearance of species, others, including the members of future generations could be deprived of some recreational or aesthetic pleasures, while others would be affected in terms psychological by the exploitation of areas that feel spiritually bound to (Elliot, 2006). On the other hand, there is a possibility that the disturbance of the natural balance prejudices people's living conditions.

An environmental ethic is needed even in the conditions under which it is believed that its value is only utilitarian. Such ethics could lead to a socio-economic balance and fairness in terms of collective development. Another perspective of ethics regards as ethically significant not only the human beings but also the animals (Elliot, 2006) and plants, the algae, the unicellular organisms and even the viruses, according to a theory, the ecosystems and even the whole biosphere (Goodposter, 1978; Taylor 1981; Attfeld, 1983; Elliot, 2006). This approach to ethics is non-anthropocentric, which grants a moral standing to all living beings and to the elements of nature (Paslack, 2010), although not all have the same moral importance (Elliot, 2006).

Thus, according to a non-anthropocentric vision, the possibility that the natural habitats of certain species to be affected by the crops intended for the biomass production is morally speaking a minus, even if they would not have negative effects upon human beings. Furthermore, by altering the habitat, some species may disappear as they are unable to adapt. The disappearance of a species might be more important because that particular species may be one that fills an ecological niche leading to the imbalance of the niche and therefore leading to imbalances at the level of ecosystems.

These arguments may be sufficient to stop changing the use of land, but this must be balanced against the benefits of obtaining and using biomass as an alternative energy source. If the benefits appear to include only material goods for a part of the human beings, namely for some investors, few arguments favorable to the establishment of these crops will be found. This does not mean that the use of agricultural land and forestry for the production of biomass is an immoral act. The acceptability of such actions may be conditioned by their ultimate goal and benefits or the damaged caused to the living beings and the biosphere as a whole. Sometimes, the life-centered ethics may

take a radical form and can support the idea that not only all living beings are morally significant, but they have an equal moral importance (Naess, 1979). If this biotic egalitarianism could be justified the human intervention on the environment would be difficult to defend from a moral standpoint (Elliot, 2006).

But these ethical approaches help decision-making to protect the interests not only of human beings but also of nonhuman beings or even the lifeless forms. So regardless of our interventions on the environment, we should appeal to ethical principles that guide us according to the utilitarian conception, to maximize the happiness of the greatest number of human or nonhuman beings.

The natural environment is considered morally important both from the anthropocentric approach and from the non-anthropocentric approach.

In this context, for a genuine environmental protection, policies are needed to embed ethical principles. Therefore it takes a responsible attitude regarding the adoption and implementation of environmental policies. Also, the decision to create intensive crops for biomass production must be preceded by an assessment of the socio-economic and environmental impact. Ethical approaches are required even for the implementation policies regarding the use and production of biomass. These ethical approaches will help environmental experts and policymakers to prevent potential future environmental threats as well as the implications of unforeseen consequences on the use of specific technologies or scientific achievements (Paslack, 2010).

THE TECHNO-ETHICS - A REFERENCE AREA

This area has evolved over the years 1970-1980, as the first official definition was given by Mario Bunge in 1977, stating that a "technologist must not only display technical abilities, but be morally responsible for everything he designs or produces (Bunge, 1984).

The techno-ethics emerged:

- Of the need to limit the misuse of technology;
- To develop thoughtful principles to guide the technological process for the benefit of the present and future society in a variety of social contexts and ethical dimensions.

In the field of environmental engineering the techno ethic approaches are relatively recent and still developing. Research in this area focuses on the effects of technologies which have a negative environmental impact.

Thus, the techno ethics through its sphere of activity aims to prevent and reduce risks generated by the uncontrolled use of technology. This field

helps policy makers and environmental experts regarding the adaptation of policies. The applicability of this field in the sphere of environmental protection is justified by the fact that it brings added moral responsibility in terms of human actions on nature.

CONCLUSIONS

Today the use of biomass as an alternative energy source is viewed with enthusiasm as being one of the most widely used forms of energy along with the wind energy and the solar energy. The biomass sources are various and include both wastes (forestry, agricultural and industrial) as well as organic matter obtained from energy crops. Although biomass is present in various forms of organic matter, the most used source of energy is represented by forestry and agricultural energy crops.

It seems that this very way of obtaining the biomass can generate the most negative effects both on society and on the environment.

In economic terms the use of biomass as an alternative energy source is justified by obtaining profit. But the economic argument alone without the social and environmental assessment should not be morally accepted.

The human actions should be guided by thoughtful policies in the text of which ethical principles can be found. Given that most human actions impact the environment we need not only merely ethics but also ethics that protects the environment.

An association between a life centered on ethics, ethics centered on animal life and even the ecological holism will lead to real environmental protection and the adaptation of policies that will respect the good of the community as a whole.

Without a set of ethical principles that aim at the equity between generations, between the individuals of the same generation and the intrinsic value of the biosphere, the problems caused by human actions will intensify.

Thus, to find a balance between economic prosperity, social welfare and environmental protection we will need to appeal to the moral conscience, ethics and the principle of accountability.

To this end the field of techno ethics finds its scope. Although less applied in the management of renewable resources and implicitly involved in the management of the biomass, it can solve various environmental and social issues caused by the actions of human beings.

Acknowledgement

This work was carried out within the "Sustainability, social acceptability of the

production and use system of wood biomass in the North-East of Romania" research program. The research project contract: PN II-RU-TE-2014-4-0017, the "Ștefan cel Mare" University from Suceava.

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