Uses of peat

Matti Hilli

Vapo Oy, Yrjönkatu 42, P.O. Box 22, FI-40100 Jyväskylä, Finland
Phone: +358 20 790 5611, Fax: +350 20 790 5708, e-mail: matti.hilli@vapo.fi

Summary

Our existence on this planet is based on the resources of nature. We need oxygen, water and food to survive. In some places there is also a need for heating and warm clothing. The only real input to this system is solar radiation, which causes many phenomena and promotes life. One resource that we have learned to utilize in various ways is provided by mires and peatlands. The tradition of using these areas and the material they offer is thousands of years old. Currently, many aspects must be taken into account when thinking of the uses of peat.

Key index words: Nature, peatlands, peat

Introduction

On the very old maps showing the present-day Finland for the first time, the name is written Fenland. This may give very weak scientific evidence for the fact that the country was already rich in fens some 500-600 years ago. The geographical nomination of a larger northern area is Fennoscandia, while the entity called Scandinavia has more political history behind it. The beginning of the word remains interesting: Fenno instead of Finno. In that sense, people living in the area could be called Finns or Fenns. When consciousness of the national identity increased in Finland by the end of 19th century the activists were called fennomans although they were not very interested in fens or any other types of peatland. It seems that the word 'fen' has transformed into 'fin' in the course of time.

For the ancient Finns, peatlands were both friends and enemies. This kind of thinking may have been relevant also in other parts of Europe. Peatlands were nesting places for many migratory birds. The birds were hunted for food, but also their eggs saved many people from starvation, especially in the spring, when all winter food storages were exhausted. Later on, peatlands were developed into pasture-lands for cattle and finally into agricultural land. Especially in northern countries, there was a belief that peatlands were nests for the frost appearing in summer nights. Large areas were therefore drained, mainly to prevent the assumed frost formation. In most cases, drainage was a mistake because the large water volume at a constant temperature in the bogs actually prevented frost. The assumed frost formation and difficult terrain, however, turned peatlands into idle lands with no value. Although the total area of mires and peatlands is huge globally, the major reserves are located in the northern hemisphere. Recently attention has become focused on tropical peatlands due to the uncontrolled fires raging in various spots and due to the palm oil plantations that have been developed on pristine tropical peatlands.

We can divide the uses of peat into two categories: the use of peat *in situ*, which actually means the use of peat in the peat-containing area, and the use of peat extracted from an area and processed for a certain purpose. The first category mainly includes the use of peat in agriculture and forestry, but it also includes the protection of the peatlands. These uses of peat represent by far the largest activity.

The second category can also be divided into two sub classes: the use of peat for energy generation, and use of peat for non-energy applications. Although the use of peat for energy generation is extremely small in the global energy context, it plays a significant role in some countries, especially if other energy sources are scarce and there is an unavoidable need for heating. In this turbulent world, the security of energy supply is not a minor issue; it plays a decisive role when making investments in new power plants. Peat extraction offers a very important local job opportunity because it is a long-term activity, usually over 20 years. When we keep in mind the ambitious targets for the share of renewable energy sources set by the EU Commission until 2020, it is easy to understand the role of rural areas and of the labour force needed to collect and transport the biomass materials to the end users.

Keeping the countryside alive is the key issue, and peat plays an important role in this. Peat is not a competing fuel for wood or reed canary grass; it helps these difficult materials in co-combustion and adds to the security of supply. It is clear that none of the new power plants or heating plants constructed in the future will be able to rely on one fuel only; they must have the technical capability to use various fuels as such or as controlled mixtures. This argument is relevant in the countries that currently use peat for energy. Peat will act as a biomass booster in those countries also in the future. New ways to produce new fuel peat products in a way that better meets the criteria of sustainable development will increase the acceptability of peat as an energy source, but there is still development work to be done.

The non-energy use of peat is more widespread than its use for energy. The superior capacity of peat, not only that of slightly humified Sphagnum peat, has made peat the best growing media constituent in professional growing. Hobby

gardening is also much safer with peat than with materials that have varying or unstable qualities. The use of peat as litter keeps animals in good health and improves their well-being. Additionally, there are many other minor applications of the use of peat, such as peat balneology, biofilters, insulating materials and whiskey flavour, just to mention some of them. Commercially they represent a small fraction of the uses of peat but emphasise the multifunctional character of peat material.

During the last 30 years our knowledge and understanding of the nature of peat and peatlands have increased. Peatlands are no longer regarded as idle lands but as unique biotopes. According to our current judgement many mistakes were made by our predecessors, but we can not carry full responsibility for their actions; they took place in their time, and the purpose was either to survive or to earn income.

Right now the dominating concern is climate change. A number of discussions deal with this topic in one way or another, not forgetting the uses of peat. The results of extensive research conducted in Finland (Minkkinen *et al.*, 2007) show that peatlands contribute to the climate change in many ways. The conclusions of the summary report of the research indicate that there are peatlands that should not be developed for industrial use, because the use of peat causes long-term negative impacts on the climate. On other hand, there are peatlands that in fact should be taken into use because they are potential greenhouse gas emitters. These areas were drained for other purposes in the past, e.g. for agriculture, but were, for some reason, abandoned later. Peat, however, continues decomposition into carbon dioxide and dinitrogen oxide, while the material or the energy content of the peat mass is lost. If peat from such areas is used to replace true fossil fuels (peat is between biofuels and fossil fuels according to IPCC re-classification), it mitigates the climate impact. The essential point is the restoration or the reclamation of the area in such a manner that it starts to sequester carbon. One of the promising new alternatives is reed canary grass, which is cultivated in Finland on both peat and mineral soils. The total cultivated area will be slightly over 20,000 hectares in the coming summer. The cultivation of Sphagnum also seems to be an exciting exercise, but it is still in the early stages.

Conclusions

In history, we have a plenty of examples of peat and peatlands being essential elements for mankind. Since the resources on this planet are limited, a wise use of all the materials is necessary. We must favour the use of solar input in all its forms because it is the only real source of energy - all the others are conversion units. This means that the 'wise use' concept is still valid and should be applied in an unambiguous manner. The concept needs tools, such as life cycle analyses, to be implemented (Kirkinen *et al.*, 2007), and certification procedures as a result. With these measures, the peat industry is ready to meet the challenges of the future.

References

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