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**SUSTAINABLE MANAGEMENT OF LAKES TAKING  
INTO CONSIDERATION THE TOURISM AND NATURE  
CONSERVATION IN AUSTRALIA AND NEW ZELAND*****Małgorzata Kurlęto***Department of Management in Tourism  
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## Abstract

The paper attempts to present the issue of sustainable development of tourism lakes on the example of New Zealand, classified as world leaders in the field of tourism use of the lakes, and Australia featuring a variety of interesting use of the lakes, not only from tourism. point of view. The study is trying to focus on particular attention to the negative effects posed by the development of tourism in the lakes. The analysis has also been an attempt to show the strategy to counteract these negative effects and tested strategies for the comprehensive management of lakes in the economy with particular emphasis on tourism. This paper is trying to demonstrate the use of zoning strategies of tourism and “Triple Bottom Line” strategies for managing tourism in Australia and the specificity of the “Living Lake” project in New Zealand. This analysis would like to also find links entrepreneurial activity in understanding the dynamics of the tourist economy and protection scales of the lake ecosystems. Understanding the relevant processes of tourism lakes is essential to a better understanding and future planning of the economy of lakes. Despite the diversity of tourism lakes issues relating to its geographical location and their specificity in Australia and New Zealand seem to look for similarities on both the use of lakes and the threats posed by the development of tourist enterprises.

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UWZGLĘDNIENIEM TURYSTYKI I OCHRONY PRZYRODY W AUSTRALII  
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Słowa kluczowe: turystyka jezior, zrównoważony rozwój, kompleksowe zarządzanie.

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## A b s t r a k t

W opracowaniu przedstawiono problematykę zrównoważonego rozwoju turystyki jezior na przykładzie Nowej Zelandii, zaliczanej do światowej czołówki w zakresie turystycznego ich wykorzystania i Australii cechującej się ciekawą różnorodnością wykorzystania jezior nie tylko z turystycznego punktu widzenia. Ze szczególną uwagą zanalizowano skutki negatywne, które niesie rozwój turystyki dla jezior. Podjęto także próbę ukazania strategii przeciwdziałania im i poddano badaniu strategię kompleksowego zarządzania gospodarką jezior ze szczególnym uwzględnieniem turystyki. W analizie starano się zaprezentować wykorzystanie strategii strefowania turystyki i strategii *Triple Bottom Line* w zarządzaniu turystyką w Australii i specyfikę stosowania programu *Living Lake* w Nowej Zelandii. Autorka szukała powiązań działalności przedsiębiorczości turystycznej ze zrozumieniem dynamiki gospodarki jezior i ochroną jej ekosystemów w różnych skalach. Zrozumienie istotnych procesów turystyki jezior jest niezbędne do lepszego zrozumienia i przyszłego planowania gospodarowania jeziorami. Pomimo różnorodności problematyki turystyki jezior związanej z geograficznym położeniem i ich specyfiką w Australii i w Nowej Zelandii, jak się wydaje należy szukać podobieństw zarówno w zakresie wykorzystania jezior, jak i w zagrożeniach związanych z rozwojem przedsięwzięć turystycznych.

**Introduction**

Lakes are the potential of interest to tourism. Understanding the relevant processes of lake tourism is essential to a better future planning of inland water resources management. For many years, experts in aspects of the environmental protection and water supply issues are trying to solve the problems of sustainable tourism and protection of lake ecosystems in the joint international conferences, such as the International Lake Environment Committee (ILEC). Strong interest in this type of conferences (previously held in Argentina, China, Denmark, Hungary, India, Italy, Japan, Kenya, and USA) proves that even the most remote geographical location are no barrier in the common search for solutions to the building optimal methods and conditions for lake tourism development.

This paper is attempting to present the issues of sustainable development of lake tourism on the example of New Zealand, classified as world leaders (COOPER 2006) in terms of their tourist use (such as Lake Taupo and Lake Wanaka) and on the example of Australia, which is characterized by an interesting variety of freshwater and saltwater lakes, used not only for tourism (Lake Eyre), but also to gain power (Lake Pedder), or other highly profitable projects (Lake Eildon). Sustainable economic development is the ongoing challenge of lakes in which water resource management and tourism projects should strive for closer cooperation in order to understand and protect the ecosystems of lakes both in local and global levels. This paper attempts to analyse the use of lakes, both in terms of the benefits of tourism, and from the threats it brings to ecosystems, especially in the degradation of biological diversity.

This analysis is trying to approach strategies to counteract the negative effects of tourism, taking into account: the so-called Comprehensive (Integrated) Lake Tourism Management, the so-called Planning of “Tourist Zoning” (*Zoning schemes* 2010) and very popular (recently in Europe) project of Living Lakes (*Eastern european network* 2006).

The analysis would like to provide examples of sustainable lake tourism management that benefit both tourists and local people, and above all for the environment – that is, taking into account the use of so-called strategy: Triple Bottom Line (*Sustainable recreation...* 2002) using a variety of issues associated with its geographical location of lakes and their specific case.

### **The economic use of the lakes**

The lakes play an important role in sustainable water management challenges, which communities face today to unequal access of fresh water. Lakes also supports a number of human activities, including agriculture, commerce, transport, sport & recreation, tourism, food production and electricity supply. Lakes are often home to a variety of unique animal and plant organisms so important is biological regeneration of their areas.

The district of lakes, in particular areas close to lake shores, are important for urban land development. Lakes can be the reservoirs of drinking water also occupy an important place in fisheries management. The issues mentioned above should be regulated in accordance with the guidelines of the United Nations (*Making tourism...* 2005).

Lakes also form a microclimate, provide flood protection, are habitat for biodiversity, and are complementary to the groundwater. Microclimate of the lake area is beneficial to man, when the lake water level is maintained (COOPER 2006).

The existing empirical studies show that in lake tourism can be distinguished 53 different activities, which are described in the literature, as well as in newspapers and advertising materials of tour operators. All activities are taken in consideration in the development of tourism enterprises (TIKKANEN 2003, GROMADA and LORANT 2009).

Usefulness of lakes for tourism is examined from the perspective of leisure tourism, sightseeing and specialized tourism (MIRSANJARI 2007).

Lakes around the world are used for eco-tourism, recreational tourism, sports, conference (business) and usually attracts millions of tourists. Lakes can significantly contribute to the socio-economic development of the site (TIKKANEN 2003).

## The threats of tourism to the ecosystem of lakes

The tourism industry is closely related to environmental protection. Rapidly developing patterns of modern travel and tourism has led to intense exploitation of natural resources. Tourism has caused negative impact on the ecosystem of lakes (MIRSANJARI 2009). It forced the local authorities for the conservation of the environment not just the lakes, but also their surroundings, especially in building tourist facilities. In addition, intense tourist activity in a limited space of environment-sensitive lakes brings a lot of negative effects. Some lakes are located in geologically unstable areas. Large areas are subject to settling and soil creep, which negatively affects the entire ecosystem. There are also other risks, mainly related to wastewater discharges from local villages, hotels and lodges. Lack of applicable laws, poor infrastructure, environmental protection and the growing tourism activities usually lead to adverse consequences for the natural reservoir of freshwater. One characteristic of lake tourism is a high degree of seasonality. This is true particularly for the sensitive ecosystem of lakes located at high altitude, as well as for lakes located in wetlands. Often visitor access to these lakes is limited to summer months, which are also the peak period of biological activity for the local fauna. Camps and activities of tourists is a threat to birds, especially when it concerns their nesting sites (RANADE 2007).

Another serious problem adversely affecting the environment is linked to increased traffic on the roads around the lake during the peak tourist season.

The effects of the negative impact of tourism on the natural environment of lakes are dependent on biodiversity and abundance of flora and fauna located in the area. Environmental pollution, as well as the introduction of foreign animal and plant species pose the greatest threat to biological diversity of the lakes.

Situation resulting from over-exploitation of wetland resources, pollution caused by fuel and plant protection products degrades water quality and pose a serious threat to the surrounding flora and fauna (SPIRES 1996). These problems stem largely from the impact of human activities. Water tourism and recreational activity is a threat to the most environmentally sensitive lakes. An increasing number of motorized boats and jet skis, especially when not governed by any legislation that imposes additional fuel pollution of lake water, both in the case of accidental spills, and as a result of deliberate discharges of waste oil into the lake.

These pollutants are a deadly threat to many aquatic animals and plants. In addition, noise and action of the waves generated by a turbine engine boats can damage the edges of lakes, and after some time it can lead to irreversible damage to their micro-ecology (*Community strategy...* 2004).

The increase in the large number of tourists leads to chaotic development of tourism infrastructure. Often intense tourist development is not integrated into the surroundings. The beauty of the landscape is changing so rapidly. Open spaces often are turned into car parks, recreational areas and golf courses (FINLAYSON et al. 1998).

But the greatest damage to the tourism economy of lakes occur in cases where their water resources are used for water transport, the supply of drinking water, for hydroelectric power, the economic intensive fishing, for the controlled release of flood, or the construction of irrigation systems (RANADE 2007). It seems that the particular interest in the subject matter deserves, should be given for the protection of biodiversity resources of the lakes. The fresh water biological diversity is declining faster than terrestrial ecosystems.

Although fresh water is only 0.01% of the stocks in the world and covers only 0.8% of the Earth, yet this small amount of water is used by at least 100,000 species of flora and fauna – for this reason, natural freshwater biodiversity is covered by international protection (UN Resolution 58/217 of 23 December 2003, “Water for Life”). If there would be no international protection of aquatic ecosystems (assuming that the trends in human consumption of water and its use of business and tourism remain the same) than a significant amount of remaining biodiversity living in fresh water would perish in a relatively short time. Threat to global freshwater biodiversity loss are available in five categories (DUDGEON et al. 2006):

- over-exploitation of the lakes,
- water pollution,
- the problem of water flow and its modifications,
- the destruction or degradation of habitat flora & fauna,
- introduction of alien species of exotic flora and fauna.

The total accumulation of these risks and their interactions affect the rate of biodiversity loss worldwide. In the literature on environmental protection there is a consistent view (ANIGACZ and ZAKOWICZ 2003) that nowadays there are following major sources of pollution of lakes, located near the living settlements of people: urban waste water (containing such detergents, pathogenic micro-organisms) and industrial (including salts of heavy metals, sulphur and nitrogen compounds). As a result of agricultural activities to surface of waters can get (used to excess) organic fertilizers and improperly applied pesticides. Extractive industry (including mining) discharge into groundwater very large amounts of highly saline wastewater (ANIGACZ and ZAKOWICZ 2003).

## Sustainable development and management of lakes

Sustainable development has become of great importance at many different levels of management (ranging from international to local). Tourist companies and so-called tourist destinations are also to play a significant role in the achievement of sustainable forms of tourism in the innovation system (MISAN-JARII 2007).

- Management of lakes includes (HALL and HÄRKÖNEN 2006):
- setting the timing of phases of tourism,
- dividing the lake into zones,
- introduction of rules relating to the use of lakes,
- planning and management based on social needs,
- planning regulations related to sustainable use and protection of lakes.

Lake tourism managers must take into account the differences in the perception of the same issues by different groups of stakeholders (especially environmentalists and people connected with tourism ventures).

It is necessary also to complete the integrated management, which seeks to focus on securing a total of: (HALL and HÄRKÖNEN 2006) collective, educational, economic, environmental, recreational and cultural issues.

Integrated management of the lakes may have three interpretations (MITCHELL and BRUCE 1990):

- systematic management of the different sizes of lake water, surface water and groundwater, taking into account their quantity and quality,
- management of the lakes along with other water systems (rivers or the sea bordering the lake), and together with the terrestrial environment,
- management of lakes, including the interaction with the social and economic environment, which constitute the so-called. Environmental Approach Sustainable Development.

In light of the legal act issued in Australia, *Sustainable tourism... 2002* in the management of tourism policy should be considered concept the so-called. Triple Bottom Line, (Concept of 3 P: *People, Planet and Profit* succinctly describes the Triple Bottom Lines and the goal of sustainability – ELKINGTON 1997) which include:

- protection of fair and beneficial business practices of the local community,
- protection of lake tourism,
- protection of biological diversity and maintaining ecological processes.

Released in Australia on 11 of October 2011 – The Act On Sustainable Tourism Policy (*Natural Resources... 2011*) also mentions the so-called Tourism Zoning Plan, which should be harmonized with the natural circumstances, so that tourism does not bring negative impact on the environment.

Plan of Tourism Zoning is based on the indexing of nature (including the conservation status of species and wildlife habitats) to determine their sensitivity on various forms and types of tourism activity (Eastern European network, Program *Living lakes* 2006).

### **Lakes tourism in Australia**

Australian continent is rich in lakes. It is estimated that the total area of lakes and wetlands is about 81,000 square kilometres, of which nearly 20,000 square kilometres of lakes and wetlands is situated in Kakadu National Park (*A directory...* 2001). Within Australia there are glacial lakes, volcanic, coastal lakes and seasonal reservoirs. The largest freshwater lake Mackay with an area of 4737 square kilometres is located on the border between Western Australia and Northern Territory (1/3 of the surface), which is managed by the Lake Mackay Aboriginal Land Trust. The saltwater lake Eyre with an area of 4176 square kilometres is located in South Australia (*Australia's Ramsar...* 2010).

Australian legislation concerning the regulation distinguishes the following types of lakes:

- constantly freshwater lake with an area of more than 8 hectares, including rivers and lakes of the arcs,
- seasonal freshwater lake with an area of more than 8 hectares,
- constant salt lakes,
- seasonal salt lakes.

Analysing the water environment in Australia, refer to the two key themes:

- How important are water ecosystems for tourism in Australia?
- What is the impact of tourism (if we believe that it exists at all) on aquatic ecosystems?

In the context of these two topics are organized in Australia conferences every two years, in order to exchange information on the review of the ecological status of lakes and water policy plan: annual, five-yearly and ten-yearly. Established at the government level specially Forum of Ministers (in the squad, which includes the ministers of all the economic ministries) established a “Joint Advisory Committee”, whose aim was to provide continuous support in developing regional water policy decisions, including tourism lake (HADWEN et al. 2006). Forum of Ministers set up the “Scientific Advisory Committee”, whose job was giving opinions scientific and technical matters relating to the sustainable management of lakes (HADWEN et al. 2006). A study conducted by experts, “Scientific Advisory Committee”, generally acknowledged that: 1) despite dynamic development of the tourism industry in

Australia, the section on lake tourism has a relatively small proportion of total tourism. 2) influence of tourism on ecosystems in Australia is relatively small in comparison to other large ecosystems in the world, many of which are threatened by unsustainable water extraction, urbanization, and problems related to water quality and modifying its flow by dams, weirs and other accumulation of water (*Integrated water...* 2009).

The above-cited opinion it is questionable if one takes into account the ecological destruction caused by the construction of hydroelectric and damming the water at Lake Pedder in Tasmania. Example of Lake Pedder deserves special attention because it concerns not only the destruction of the environment of the lake, but the fight for its survival. Although the new Lake Pedder (with an area of 242 square kilometres) was established in 1972 as a result of the initial flooding of the lake of the same name, it does not like it before, neither biologically, nor the size or appearance (Lake pedder 2012).

A newly formed lake was connected to the canal from Lake Gordon and together create a large artificial reservoir hydroelectric power. The present Lake Pedder was the accumulation of water, resulting in construct three dams: Edgar with a height of 17 m, Scotts Peak – 43 m, Serpentine – 38 m, which had plans to meet the reserve tank for the hydro Gordon Power Station (Lake pedder 2012).

The protests in Tasmania and mainland Australia and around the world, referring to the primary reservoir of the lake, took place not only before the construction of hydroelectric power, but as well during construction and after commissioning the dam and hydroelectric power for use. These protests have already started in the stage of planning the creation of the hydroelectric power plant on Lake Pedder, which was approved in 1972 (MCKENRY 1972).

Opposition to the flooding of Lake Pedder, located in the so-called protected area the world's cultural heritage, caused its inclusion, in 1982, on the UNESCO heritage list (in the hope that it will be rebuilt the biological environment of the lake). Concern about the construction of the dam was caused by the threat of losing its unique flora and fauna. During the flooding of Lake Pedder lived in this lake seventeen endemic species of plants and animals. Flooding of the lake, destroying the original biological ecosystem. Since 2003, Lake Pedder is recognized as endangered ecological. Animal species living in this lake are on the Red List of IUCN (International Union for Conservation of Nature), as a species highly vulnerable to extinction (MCKENRY 1972). Special protection (under state law Threatened Species Protection Act 1995 and the Federal Biodiversity and Conservation Federal Protection Act 1999) include such endemic fish species Pedder Galaxias (*Galaxias pedderensis*) and Swamp Galaxias (*Galaxias parvus*). Currently, Gordon hydroelectric power management taken several initiatives for the sustainable development of both lakes: Gordon and Pedder.



As an example of integrated management of lakes in Australia is indicated in the Australian Government Documents (*Integrated water...* 2009) – Lake Eyre – largest saltwater lake in Australia, on which, in the third millennium, agreement was concluded between the state governments of South Australia, Queensland and the water company Lake Eyre Basin. This agreement covers the sustainable management of natural water resources related to the basin of Lake Eyre. The agreement contains the arrangements for resource management principles of the lake and associated values: environmental, economic and social. The agreement also includes the jointly accepted principles relating to eco-tourism as well taking into account the knowledge and experience of local communities. It should be emphasized that the Lake Eyre is certainly an unusual example, because the lowest part of the lake in Australia (about 15 m below sea level), in the desert. Lake Eyre was only 3 times in the last century (as a result of heavy rainfall) completely filled with water. It happens that during the dry season the lake is completely dry (*Integrated water...* 2009).

Managing water area of Lake Eyre, seems to be more focused on sustainable development and taking more preventive measures than in the cases of other lakes in Australia, although they certainly deserve in-depth discussion in a separate analysis.

An interesting example of the tourist use of permanent inland water in Australia could be Lake Eildon in Victoria, which for many years has been a place of rest and a haven for a large fleet of boats.

Lake Eildon is famous for its privileges for good conditions for water sports because of the large surface area (166 square kilometres) and an extensive line of coast (550 km). Infrastructure and facilities around the lake include camping, motels, boat rentals and a number of residential service facilities for tourists, picnic areas and public and private marinas for boats.

The Board of Lake Eyre Basin cares about preserving water quality, which is the main motto of the organization centre. Lake Eildon is the only reservoir in Victoria, where sail boats and yachts with luxurious cabins and sleeping places. To avoid any risk from contamination of water must be adhered to strict rules. Yachts that were allowed to sail in the lake must be equipped with sewage tanks approved for use by the water company.

Management, including planning and raising funds for the development of Lake Eildon, does not have the character of the integrated management (taking into account the needs of the local population), because the lake has become a multi-million project for the company, which charges the owners of dozens of luxury yachts, annual fees of several thousand dollars for the maintenance and control of all tourism projects, ensuring their ability to achieve the best housing and facilities for water sports, fishing and participating in other tourist attractions. In planning of Lake Eildon development are

involved the owners of yachts. At Lake Eildon, there are sanitation stations for pumping sewage from tanks of yachts and houseboats. Water Company also has a floating barge – sewage treatment. Discharge of sewage or solid waste into the lake is treated as a crime. Lake Eildon and the Goulburn and Murray rivers are combined into one body of water so the water resource management and management of tourism is common for the water system (*On land and water...* 2012).

Another interesting example of the development of lake tourism (and lake district area) in Australia may be pointed out – Metung Village, situated between Bairnsdale and Lake Entrance. Metung is a waterfront Village located on the Gippsland Lakes. Project of Metung was planned for every tourists practicing fishing boats and water sports. Metung has all reason to be an example of a well-organized integrated management taking into consideration not only the private interests of a limited number of owners luxury yachts, but also takes care of the local community, tourism and regional economic development as well taking into account the environmental protection of lakes. Metung join the waterway of the Gippsland Lakes (including famous – Lake Entrance – managed with regard to sustainable development as holiday destination and fishing port at the same time). This connection of water constitute the largest navigable inland waterway in Australia, which is a relict of a narrow channel that connected the Lakes to the ocean.

The research concerning water system in Australia (*Streams and lakes...* 2012), carried out by tourism businesses, local governments, water resource managers, residents and tourists provide much information on the frequency of use land and water, indicate the principles and strategies for sustainable development, trying to limit the negative impact of tourism on nature and protect the ecosystems of lakes. This research shows favourable assessment of using ecosystems of lakes in Australia for tourism.

### **Lake tourism in New Zealand**

In the literature referring to lake tourism New Zealand is mentioned next to Canada as a place with the greatest number of lakes used for tourism with a properly prepared infrastructure (RANADE 2007).

In New Zealand, the total area of lakes covers an area of 3398 square kilometres (*A directory of wetland...* 1995). Lakes in New Zealand are covered by government grants for the restoration of its unique ecosystems. The problem of sustainable management of lake tourism in New Zealand is somewhat complicated. The monitoring and study of specific issues with respect to lake tourism in this country is extremely difficult (CARR 2006).

The main difficulty standing in the way of implementation of sustainable lake tourism has historical connections. Under the Treaty of Waitangi (1840), Maori community was to be guaranteed the right to "... to have their lands and estates forests, fisheries and other property, which may collectively or individually possess ...". Hence, using lake tourism local authorities must take into account the rights of the indigenous Maori population, for which the lake is their heritage (KURLETO 2011, TUOHINO 2006).

Interestingly it appears at this observation the fact that even New Zealand, which enjoys a reputation as a "green country" suffers from a lack of data that would be an objective basis for the estimation of lake tourism and that would allow monitoring of the tourist influence on lake environments (which in turn would indicate the size environmental impact of tourism on lakes).

ERKKILÄ (2006), which analysing this issue, says that the precondition for the success of lake tourism are: first, searching for an integrated approach to management development and marketing of this kind of tourism, and secondly, respect for the obligations of the "winning strategy" (*Win, Win Strategies* 2004), which shows host communities in harmony with the needs and expectations of tourists. The mentioned author also points out that lake tourism operates in an extremely complex and fragile environment. This is the main reason of balanced policy requirement for lake tourism.

It seems to, that interesting examples of policies for sustainable management of lake tourism in New Zealand refer to Lake Taupo and Wanaka. Lake Taupo – area of 606 square kilometres and a circumference of about 193 kilometres, is located in the middle of the North Island, in the Tongariro National Park (inscribed on the UNESCO World Heritage List) and is the largest lake in New Zealand. From this lake flows out of the country's longest river – Waikato, head north through areas covered with volcanic soil. Adjacent to the lake volcanoes Tongariro, Ngauruhoe and Ruapehu, a perfect background for all leisure and tourism, dominated by water sports, especially kayaking. Lake Tapuo annually visited by more than 1.2 million tourists (Lake Taupo. 2012).

In the sustainable management of Lake Taupo Tourism interact local and national security agencies. Local and regional authorities (Taupo District Council and Ruapehu District Council, Waikato Regional Council, Regional Council of Manawatu-Wanganui and Hawkes Bay Regional Council) have to consult together on matters of governance, including of water quality monitoring, fire control, removing solid waste, sewage, pest control, as well as on general issues of spatial development (especially in the context of the need to protect areas of natural, cultural and historical value of places) (WRATEN 2011).

Effective planning is the foundation of a strong tourism management for achieving an optimal balance the impact of sustainable tourism and protection of the ecosystem of the lake.

Lake Wanaka with an area of 192 square kilometres situated on the South Island is one of the best-organized tourist destinations in New Zealand. Due to its mountainous location, Lake Wanaka Tourism has two seasons: summer and winter. This place offering many tourists activities. Tourists can get involved in water sports including sailing, canoeing, rafting, jet-boating, but also there are the possibility of hiking, mountain biking, climbing, fishing, hang gliding and para-winter winter sports. The area surrounding Lake Wanaka tourists have an access point to the highest mountain in New Zealand, the Cook Mountain (3754 m), and the peaks of mountains Aspiring and Tititea (Lake Wanaka. 2012).

New Zealand successfully established its brand promoting the slogan “Clean & Green”, “100% Pure New Zealand” (*How green...* 2011) attracting to the country millions of visitors from around the world. This country may be a good example of sustainable tourism, able to both: preserve the ecosystem resources of the lakes as well as all the comfort and security for tourists. However, this does not mean that here there are no problems with pollution of lakes, which result from intensive agriculture and farming (which is referred to “dirty dairying” – Lake Wanaka. 2012). Pollution on lakes Waikato, Rotongaro Hakanoa and Kainui and Ngaroto and Waahi and Whangape were the subject of press health warnings, appearing in the New Zealand Herald (From 2004 to 2011, Lake Wanaka. 2012). Water samples, which were taken from the lake Waikato has revealed a toxin microcystin, samples from Lake Rotongaro blue-green algae – *Microcystis*. Algae levels were 40 times higher, and the toxin levels were 760 times higher than water quality standards.

Toxins can get into lakes from fertilizer and sewage runoff, because there are lack currently filtering systems such as natural forest areas and wetlands. Over the past 50 years, many farmers drained the wetlands in order to achieve more production from additional grazing area. A large amount of toxins is also associated with a high level of fertilization in the absence of mini-ecosystems protection. The cases of water pollution of lakes in New Zealand underlines the importance of adequate checking of water purity and preserving of eco-systems. In New Zealand, similar like in the European countries, for the protection of life in the lakes are placed the program: Living Lake. In 2007, 2009 and 2011 conferences were held on this subject (WRATEN 2011).

A specific feature of New Zealand’s Lake Living programs is that in addition to the recommendations relating to the environmental values of lakes, to protect its flora and fauna and the entire ecosystem and biological diversity also draw attention for historical awareness of these lakes (*Community strategy...* 2004).

## Conclusions

The analysis shows that in Australia and even more so in New Zealand, sustainable management of lake tourism is balanced, caring for the protection of: ecosystems, the local community and also appreciating the value of tourism (Triple Bottom Line). It should be noted that Australia and New Zealand have the only one consul – ANZECC (the Australian and New Zealand Environment Conservation Council), which sets the guides on the water quality (Using Anzecc. 2012) common to the two “sister countries”.

Some issues that affect the estimation of tourist influences (especially in New Zealand) must find a solution considering the implementation of the program Living Lake as soon as possible. Further research on the influence of tourists on lake environments are urgently needed. It is important to establish regulations on tourist influence on the environment of lakes (and for the tourist zoning necessary to protect the lakes) under which it will be possible to use proper engineering for the planning of lake tourism.

It should be emphasized that the travel management of hydrological resources, including the use of waterways will be in the coming years, more and more important both because of the increasing demand related to lake tourism and because of the escalating effects of climate change, which are becoming more severe. Managers of lake tourism must take into account the differences in the perception of the use and protection of lakes by various stakeholder groups and the paradox of improper behaviour by tourists, despite their apparent ecological awareness.

In conclusion, the risk that tourism brings to the sensitivity of the lake ecosystem should be noted, especially by: motor boats, intensive recreational fishing, throwing fuel and sewage into the waters of lakes and campsites, which are located too close to the shores of lakes.

The lake ecosystem recovery should strengthen the control of pollution of lakes and make their “rehabilitation”, so as to restore the ecosystem and take action as soon as possible focus on positive changes in the ecological civilization (WUHAN 2009).

Sustainable economic development of lakes is a constant challenge, in which those responsible for the plans and management of lakes and lake districts should strive for closer cooperation. In order to understand the ecosystems of lakes, the global experts studying the problems of lakes (including tourism lakes) combined their efforts to create a new international network known as the Global Lakes Ecological Observation Network (*Global lake...* 2012). GLEON community is proof of effort undertaken to understand the dynamics of the economy and protect the lake eco-systems, flora and fauna, at different scales.

The recommendations relating to the management of lakes (including tourism) and all its stakeholders are as follows (*Global lake...* 2012):

- develop and implement a comprehensive strategy for rehabilitation of lakes, which include strict measures to protect the environment and promote sustainable development of tourism in order to reduce the pollution of lakes ecosystems;
- finding new and innovative financial instruments to provide financial resources necessary to maintain the natural ecosystems of lakes;
- promote cooperation with governments, communities, the tourism industry and NGOs, and promote the participation of the local population as the basis for joint action-oriented regulatory approach to the common goals of environmental protection of lakes and sustain ecosystem services.

Encouraging innovation in the implementation of new management concepts lakes in the zoning of tourism, promotion of integrated lake basin management and implementation of multi-disciplinary technology to enhance the ecological restoration of lakes.

All the above recommendations should be followed up care being careful and aware that her dwindling water resources of lakes, the pollution of their waters, degraded ecosystems, pose a serious threat both to the survival of mankind and sustainable development.

Translated by MAŁGORZATA KURLETO

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