

**National University of Public Service**

**Doctoral School of Military Sciences**

Krisztina Ligetvári:

**LACK OF FRESHWATER AS SOURCE OF CONFLICT AND MIGRATION  
STIMULATOR IN THE REGION OF THE MEDITERRANEAN SEA**

Author's description of the doctoral (PhD) dissertation

**Supervisors:**

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**Budapest, 2018**

## **DESCRIPTION OF THE SCIENTIFIC PROBLEM**

In the region examined in the dissertation, - the south and east coast of the Mediterranean, that is, North Africa and a part of the Middle East - the relative lack of freshwater has been a source of conflict since ancient times. It is important to note, however, that today's water challenges are significantly different from those of the past. The causes lie in the rapid change in the socio-economic, environmental and political contexts of the region, such as the large-scale and rapid growth of the population and urban expansion, urbanization.

Increased consumption leads to excessive use of water resources, coupled with inadequate government measures to save water. Inadequately managed equilibrium in the water-energy-food relationship also contributes to the over-utilization of water resources. Drinking water is a necessity for life and access to freshwater is an extremely important base of the countries' economies. Until the 1990s, access to water resources and the lack of drinking water were not a day-to-day and priority issue in the world press. There were no signs that this would be one of the root causes of progression. The water source problem was only tied to water quality. Climate change has pointed out that the main issue of adaptation to changing climatic conditions is water itself, the quantitative and qualitative problems of it.

Taking into account the renewable water resources, enough drinking water would be available to all residents of the earth (1,700 m<sup>3</sup> per year). The problem is that this amount has been unevenly distributed geographically; and the climate change transforms the weather systems in a way that the distribution of precipitation moves to extremes. The southern and eastern shores of the Mediterranean Sea have so far been the poorest region in water in the world. Thus, the European Union is not indifferent to the prospects of the countries in the region, what conflicts, tensions - including water - exist among them, and which poses a risk to the future of the European Union. Many countries in the region are currently under the stress limit of 1000 cubic meters / year, but by 2025, all countries will be close to or below this limit.

Since providing water in long-term is a fundamental goal and task for all countries, this will further strengthen regional conflicts in water-deficient areas. As a result of the facts and data, in the region discussed in my dissertation, the smaller or greater conflicts of water can be persistent in the future, as it has happened in the past.

Concerning the countries of the Southern and Eastern coast of the Mediterranean, we are talking about three major areas, Jordan, Tigris, Euphrates and the Nile River basin. There are more water conflicts among countries affected by rivers with still unresolved final settlement. The examination of water disputes and conflicts around the Euphrates, the Tigris and the Nile

rivers requires an analysis beyond the countries of the investigated region in my dissertation, as the drainage basins do not know national boundaries.

Seeing the many conflicts for the possession of freshwater resources, it is extremely important to regulate water issues in international relations, which is not a new phenomenon at all. Its history dates back to the end of the 18th century, and since the end of the 19th century its importance has even increased, especially as a consequence of the population explosion and urbanization. The sources of conflict emerging from the growing demands for natural resources have become the focus points of foreign policy. Regarding access to water, among the issues requiring international regulation, the most important are the rights to the use of cross-border rivers and still waters. Most conflicts among the states regarding freshwater usage are also taking place because of that.

The reason why the main source of conflict in water disputes is the exploitation of water systems is the fact that 151 countries share 268 international drainage basins, which accounts for about 42% of the Earth's surface and 60% of its freshwater resources. About 42% of the world's population is located in the affected areas and their freshwater supply is provided by these sources.

To the presentation of the problems caused by water conflicts and the negotiations among the concerned countries in order to resolve them, and of the international processes, cooperation and established institutional systems, the concept of "political water" has been created, the elements of which are global water policy, state conflicts and hydro-policy. Global water policy is a relatively new term. It was first used in the 1990s and means an important element of access to water as a fundamental human right. In their hydro-policy, the states emphasize the water distribution and negotiation processes around rivers, river basins, river basin districts which are crossing their borders and also their "hydro-political dilemmas" for why and how to co-operate.

Climate change can modify the current hydro-political balance. The changes are very fast in institutional and physical systems. Institutional capacity cannot follow the speed of change, the need for changes in existing cross-border agreements in line with the changing processes, and this is the root cause of most water conflicts. The main dilemma is how to cope with potential destabilizing effects and adapt to new environmental impacts in a complex geopolitical environment along shared rivers and water bases. The acquisition, assurance, expropriation, or ambition to expropriate, and monopolization of water bases along common, international water systems can lead to intergovernmental debates and conflicts, which may cause violent incidents among hostile countries. Contamination can affect the water resources

of other countries, while nations in a more favorable water strategy position can reduce the amount of water released and affect its quality. Countries with a stronger military potential can use their superiority in water policy to threaten, influence, and force the people of their dependency. The countries at the bottom of the rivers are in particularly vulnerable situation as the upstream states often use or contaminate a large part of the water. This can lead to violent conflicts, especially when the downstream is militarily stronger than the upstream, as in the case of the Nile. Water can therefore be at the same time a source of conflict and a co-operation factor, which is best illustrated by Israel's example. As a potential source of conflict, it can worsen and aggravate relationships, but as a co-operative factor, it may serve as a common goal for those countries, which need to face this difficult situation.

To reduce the risk of water scarcity in security policy, the hydro-solidarity of countries with water strategy advantage and the co-operation of nations sharing shared water systems is needed.

## **RESEARCH GOALS**

The dissertation aims at examining four main issues

1) My first research objective is to highlight the growing importance of the challenges of social security among the security sectors of Buzan compared to the military, political, economic and environmental security sectors. The transformation of the security environment in the XXI. century is the most remarkable in this area. Social security, a new area of security studies, means the widening of the state-centered security concept, and occasionally its replacement. Today, the focus of security policy issues has been expanded with more and more new dimensions. One of these is the area of social security; one of its manifestations – among others – is illegal immigration. My aim is to confirm the fact that migration problems related to water security are already a decisive challenge for Europe and this is likely to continue for decades.

2) My second aim is to prove that plentiful water resources lead to geopolitical appreciation of a country just like oil or natural gas reserves. I suppose that rich water supply brings the appearance and geopolitical appreciation of new international so-called "water bank" players. A good example for this is Turkey, which has long been pursuing a decisive "water bank" role in the eastern Mediterranean basin and in the Middle East.

3) My third research aim is to prove that today's difficulty in accessing healthy drinking water and sufficient food and the resulting health consequences are now the same fundamental threat to human life as war or persecution. Human security must mean protection from both violent and non-violent threats, freedom from pervasive threats to people's rights, security and life. These include, among others, security of access to food for physical subsistence, environmental safety, i.e. healthy drinking water, clean air and health security, such as disease and infection prevention.

4) In accordance with the above, it is also my research objective to examine to what extent the difficulty of access to healthy drinking water will be the root cause of future migration to Europe.

## **HYPOTHESES**

I have drawn up five hypotheses, which I prove in four chapters through examining various questions.

1) Lack of freshwater triggers self-inducing, negative processes, which threaten the security of the given region.

2) Water shortage can cause conflicts, but the conflict itself can also cause water shortage.

3) The most significant security threat related to healthy drinking water shortage concerns the human security aspects of water scarcity.

4) Freshwater scarcity and drinking water shortage will become one of the key issues of the Euro-Mediterranean relations in the coming years and will become the main cause of a number of future conflicts and security challenges. The increase in limited access to healthy drinking water projects local conflicts in Europe's neighboring areas. In connection with this, the impoverishment of societies will bring forth significant migration that could threaten Europe's security. A rapidly growing number of "climate - water refugees" is expected.

5) The European Union and regional organizations have launched a number of programs to ensure that more and more people can have access to healthy and adequate quantity of drinking water in the region covered in my dissertation. The efficiency of these programs is questionable, the laws and definitions need to be revised in order to meet the current challenges.

## **RESEARCH METHODS**

In a methodological sense, the dissertation is primarily based on the analysis of primary and secondary resources. It is important to note here that the dissertation includes only publicly available literature and the author does not intend to take a commitment in the theoretical debates of geographic and migration literature; instead, the dissertation focuses on practical aspects.

### **Methods of analysis**

Concerning the specific analysis methods, the dissertation uses four complementary methods: data collection - data analysis, analysis of the literature, modeling, and presentation of the investigated issue through a concrete case study.

For the collection of the necessary data, I used data and databases (e.g. UN, WHO, UNICEF), which are widely known and generally accepted in the scientific world, and published by international organizations; I also used data from regional organizations relevant to the topic in case when data source for the specific topic was available only here. I completed the data collection by June 2018.

For the analysis the dissertation also invokes the modeling tool. I demonstrate with the help of world models that the environmental and economic problems associated with freshwater scarcity have already been pointed out. These phenomena have been re-evaluated nowadays.

## **STRUCTURE OF THE DISSERTATION, SHORT DESCRIPTION OF THE ANALYSIS**

**In the first chapter**, I present facts, data, concepts and definitions, which are the basis of the research problem, along three topics: freshwater, "forced migration" - "climate refugees", the region explored in the dissertation.

**In the second chapter**, I examine the hydrographic and water-security capabilities of the eastern and southern Mediterranean basin, starting from the global problems of freshwater security, analyzing the situation of larger drainage basins in the region. In this chapter, I emphasize the dynamics of freshwater scarcity in relation to climate change.

**In the third chapter**, I examine how and what factors make freshwater scarcity a safety challenge.

The theoretical methodological framework of the study is based on Barry Buzan's security sector theory. I analyze the interconnection of freshwater shortages and, in particular, the lack of healthy drinking water with other sources of conflict, in this framework, based on the five

basic sectors of security - military, political, economic, social and environmental – using a deductive processing strategy.

Within these, I further examine the interconnection, interaction, and cause-effect relationship of today's challenges and freshwater scarcity. I analyze the process, which, in the region described in my dissertation, population explosion and urbanization cause freshwater scarcity coupled with inefficient food production and more and more difficult access to healthy drinking water, leads to a deterioration in living conditions. The consequence of this is the intensification and widening of intra-states, among states and regional conflicts in the areas around Europe, which leads to social-size affiliation, triggers migration, thus causes serious impact on Europe's security as well.

**In the fourth chapter,** I describe how the European Union maintains institutional relations with the countries of the region on water issues including water security. I examine when the problem of freshwater scarcity emerges as a potential source of conflict in the Euro-Mediterranean relations, and in the documents and initiatives of the European Union and regional organizations and what their water policies are. I describe what programs, initiatives these organizations have launched to mitigate and manage problems related to water issues. The thesis - in line with the research objectives - confirmed the hypothesis that although the regional organizations dealing with the environmental and water problems of the European Union and the Mediterranean have been continuously launching their programs, and projects related to climate change, water scarcity and water security since the 1990s, its effectiveness, in the light of available figures and analyzes, is questionable. There is what's more a lack of co-ordination between organizations and their programs. The EU's Euro-Mediterranean cooperation, despite repeated institutionalization and continuous transformation and adaptation, has not redeemed its hopes. The reason for this is the continuous transformation of the geopolitical environment, the distrust of the southern states, their conflicts among themselves, the internal problems of the EU and the difficulties of financing.

Through a case study, I also describe the practical condensation of the mentioned problems for the European Union. The case study presents the European Union's procedural rules for the treatment of refugees arriving in Europe, the process of applying for international protection of asylum seekers and the activities of the European Asylum Support Office, the European Union's Independent Asylum Expert Agency. By analyzing the case study and other relevant EU documents, I describe what the European Union is doing in order to establish a

sustainable, efficient, effective, fair and acceptable migration management system for all stakeholders.

Furthermore, I highlight the deficiencies and weaknesses of the common European asylum system, namely that the EU cannot respond to the increased refugee / migratory pressure in line with the weight of the problem. Both the system and the legal basis for its operation need to be reviewed to address the security challenges of today and tomorrow. The water safety risks that are causing forced migration will not disappear, but rather increase, as time goes by.

## **SUMMARY CONCLUSIONS**

### **The results of the research described in the four chapters of the dissertation, based on the outlined hypotheses and the drawn up research goals**

The emergence of water scarcity depends on water demand and water consumption, as well as the amount of available water. The available water volume in a particular region and country is primarily determined by the different geographic conditions. There are many factors that play a role in how big freshwater resources a given region manages, among others the location of different climatic systems, and the geographical positions of surface and groundwater. The fact that groundwater touches more countries creates a major source of conflict, primarily in areas that are drier and already facing political conflicts. In addition, it is also determinative how quickly a particular water base can re-fill, as this may be the source of future problems.

Water is regarded as a renewable source of energy, but its volume is constantly decreasing due to climate change; and water distribution is unequal, so two thirds of the world's population does not have the right quality or amount of water. According to forecasts, nearly 2.5 to 3 billion people will suffer in such a severe water shortage that will endanger their livelihood in 20 years. There is no common international regulation on this issue and no institutionalized international co-operation on water management has ever evolved, which further intensifies the threats.

Water has never been the subject of war ever in history, but in the future this trend seems to be changing. It is projected that, coupled with other consequences of the fallen statehood, water scarcity will be one of the most important tasks to be solved by the international community.

Consequences of the water conflicts in the Middle East and Africa can be triggers of local conflicts, and have a direct impact on Europe as well. Forecasts indicate that in the Middle



East and Africa smaller-larger conflicts of water will become permanent in the future because of decreasing freshwater resources and droughts, and their escalation means a direct threat to Europe, as these processes and events may lead to an increase in the number of "climate- , water refugees " to the European Union. The dissertation concentrates on analyzing the Southern and Eastern regions of the Mediterranean for two reasons. On the one hand, the area itself suffers from the problems of freshwater scarcity. On the other hand, this is the region through which the forced migration of freshwater scarcity from other areas reaches Europe to the largest extent, i.e. the region of the South and East Mediterranean is both a direct concern and a transit region of the forced migration of freshwater scarcity.

Furthermore I confirm that the pressure, tension caused by the increase in the number of 'climate refugees' will be the key challenge for human security in the 21st century for both the originator and the host countries, in the Euro-Mediterranean system.

The lack of drinking water together with extreme weather, dryness caused by lack of fresh water and as a direct consequence food shortage will create the so-called "climate refugees". The steady increase in the number of "forced refugees" and, in particular, "climate refugees", poses a serious security risk for the originator and host countries.

With regard to the processes presented, within a few decades, the possession of freshwater resources could lead to regional wars. In the long term, only the local management of the challenges arising from the basic problem can be the solution; which means that the disadvantaged groups should have access to the resources needed for their lives in their geographical place, since the EU is not able and not suitable either for its size or for its economic, social and cultural disposition to accommodate millions of "forced refugees", in particular a large number of "climate refugees"

## **NEW SCIENTIFIC RESULTS**

1. According to the 1951 Geneva Convention, refugees due to lack of natural resources, such as lack of fresh water and food shortages cannot be called refugees ("climate-refugees"). Legislation now makes a difference between being threatened by war, persecution or being threatened by thirst and strive, or infected water or premature death. I have demonstrated through multilateral research, that international organizations have not yet given concrete answers to this intensifying challenge, they only describe the phenomenon. That is why it is necessary to review the laws and definitions to adapt to the problems, challenges and risks of the present age.

2. In section III. in the exploration of the cause and effect relationship, I put a new light on the correlation of fresh water shortage and the related challenges, risks and threats arising from the shortage itself.
3. In my dissertation, in some chapters I have confirmed from several aspects that the lack of fresh water, and in particular the lack of healthy drinking water, has become a standalone challenge for today. It can no longer be considered merely as a cause or effect within security challenges but as a separate, independent source of danger.
4. I have verified that because of the expected persistent deterioration of the water security situation, such human security challenges will be present in the eastern and southern Mediterranean basin even in the long term, which will act as a driving force for forced migration towards the EU. In other words, water safety risks leading to forced migration towards the EU will not disappear as time goes by, but will just be strengthened.

#### **RECOMMENDATIONS FOR FURTHER RESEARCH IN CERTAIN SUB-AREAS OF THE TOPIC**

1. The solutions to more efficient savings with current fresh water sources described in my dissertation is just the beginning. As the exhaustion of stocks is becoming more and more threatening, it is necessary to go on with the currently developed preservation plans. In addition, further research is needed to create technologies, water management systems and governmental measures that are even more efficient.
2. It would be worthwhile to explore more in detail those legal and regulatory possibilities that would allow to apply stricter water management to all agricultural, industrial and commercial companies. In addition, in order to preserve the good state of waters, further stricter legislation would be necessary. In order to do this, the set up of a group of experts would be advisable, and the regular consultation with them, and the final product would be a study that would justify governmental decisions. In the working group besides the governmental players, representatives of the corporate companies and the civil society should be given a place. The set-up of the expert working groups is recommended at country and regional levels to identify similarities and differences, and alongside these, a more effective co-operation can be built. In

case of larger cities, it is also recommended to set up this expert group in order to identify the specific problems and needs.

3. More detailed, price-based calculations should be made so both the companies and the population would pay the real price of the water used. This could also stimulate them for more prudent freshwater usage
4. It would be necessary for the decision makers and regulators to develop further studies, data and maps, both in terms of water quantity and quality information and in the usage side, in order to develop more effective solutions to real problems.
5. Along the trace of Cape Town's case, it is recommended to go further on the road which I have started, that the lack of drinking water caused by the persistent dryness of climate change in similarly affected cities, is no longer just an indirect or parallel problem – with other challenges of the urban population - , but a threat endangering the fundamentals of living.
6. Currently research is taking place to reduce drastically the costs of seawater desalination procedures, especially in the Middle East. If these technological solutions can be used more widely, there is another interesting question to be explored; how their success will change the nature of conflicts in the Middle East. It will certainly be even more measurable to what extent the freshwater shortage affects the confrontations in this area.

### **APPLICABILITY OF RESEARCH AND SCIENTIFIC RESULTS**

The results of the dissertation based on the research can be used in several areas. They can be used as decision-preparatory or as scientific background material in related political area. With regard to its scientific usability, it can be used primarily to research in the field of security policy. In the field of education, it can serve as a source for researchers and for academic teaching materials. On domestic and foreign conferences held on this topic it can be used as background material. It can serve as a scientific basis for launching joint projects with universities and research institutes dealing with similar research in the Euro-Mediterranean area. The exact solutions for the problems of the regions presented in the research - as the lack of fresh water, in particular the lack of healthy drinking water, unsustainable water consumption and inefficient agricultural production in addition - such as sending experts to the region, can serve as a theoretical basis of technology transfer.

## **PUBLICATION LIST**

Krisztina Ligetvári-Takács: The Barcelona Process and the Euro-Mediterranean Partnership, In: Nation and Security, III/2. (March 2010), pp. 29-34., ISSN: 1789-5286

Krisztina Ligetvári-Takács: The water issue: The main past, present and future cause of conflict in the Middle East, In: Military Science Review, 3/1. (2010), pp. 38-44., eISSN: 2060-043

Krisztina Ligetvári-Takács: Drinking water plays a decisive role in the emergence of armed conflicts in Africa, In: Military science, XX/1-2. (2010), pp. 170-178., ISSN: 1215-4121

Krisztina Ligetvári: Results of the 7th Plenary Session of the Parliamentary Assembly of the Union for the Mediterranean in the light of the events in North Africa in early 2011  
In: Military Science Review, 4/3. (2011), pp. 85-90., eISSN: 2060-0437

Krisztina Ligetvári: The main steps taken by the European Union to tackle water-related problems, future prospects, Military Science Review, 4/4. (2011), pp. 53.-64.,  
eISSN: 2060-0437

Krisztina Ligetvári: Water safety problems in Hungary in the light of world and European Union tendencies, In: Military Science, 2013 electronic issue 1., pp. 4-13., ISSN: 1215-4121

Krisztina Ligetvári: The barriers to effective water management in Hungary  
In: Military Science, 2013 electronic issue 2., pp. 85-92., ISSN: 1215-4121

Krisztina Ligetvári: The economic potential of water in Hungary, In: Nation and Security, Budapest, 2016/1., pp. 127-136., ISSN 1789-5286

Krisztina Ligetvári: Drinking water shortage as a security problem implies further conflicts, In: Hungarian Association of PhD Students, International multidisciplinary conference: "Tavaszi szél" [electronic document]: Abstract volume. Publio, Budapest, 2015, pp. 152-153. ISBN 978-963-397-702-6

Krisztina Ligetvári: European and North-African governments face major challenges in preventing and treating the potential conflicts caused by lack of healthy drinking water, In: Military Science Review, IX/2. 2016., pp. 330-341., eISSN: 2060-0437

Krisztina Ligetvári: Political Water In: Gábor Keresztes (edited): International multidisciplinary conference: "Tavaszi szél", Budapest, 2016, Hungarian Association of PhD Students, p. 144. ISBN 978 615 5586 04 0

## CURRICULUM VITAE

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### **Work Experience**

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- August 2013 - **Energy Efficiency Expert  
EU Project Manager  
Non-profit Limited Liability Company for Quality Control and Innovation in Building, Budapest, Hungary**
- Creation, implementation and consolidation of energy efficiency strategies and programmes for Hungary
  - Completion of EU documentation according to regulations
  - Contribution and implementation of the new Energy Efficiency Directive (2012/27/EU)
- January-June 2014 **Energy Efficiency Expert  
Energy Efficiency Advisor  
Ministry for Energy and Health, Valletta, Malta**
- Creation, implementation and consolidation of energy efficiency strategies and programmes for Malta
  - Contribution and implementation of the new Energy Efficiency Directive (2012/27/EU)
- 2010 - 2013 **Energy Efficiency Expert  
Ministry of National Development  
State Secretariat for Energy and Climate Change, Budapest, Hungary**
- Creation, implementation and consolidation of energy efficiency strategies and programmes for Hungary
  - Contribution and creation of Hungarian EU documents under the Hungarian EU Presidency
- 2003 - 2010 **Project Manager  
Ministry of Economy and Transport, National Development Agency, Budapest, Hungary**
- Participation in the development of the Structural Funds Institution in order to bring it in-line with EU regulations
  - Project management of the co-financed programmes and applications by the European Union in the field of Environmental Protection, Energy Efficiency, Economic Development and Infrastructure

## Science Activities

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Presentation. Topic: **European and North-African governments face major challenges in preventing and treating the potential conflicts caused by lack of healthy drinking water**, Transatlantic Policy Consortium (TPC) Conference „Rethinking Public Governance”, Budapest, Hungary, 11 June 2015

Presentation. Topic: **Drinking water scarcity, as security problem is generating further conflicts**, “Spring Wind Conference 2015”, Conference of the National Association of PhD Students Eger, Hungary, 10-12 April 2015

Presentation. Topic: **Climate-KIC’s Journey - an intensive innovation programme**, Joining Europe’s Knowledge and Innovation Communities, Introducing the European Institute of Innovation and Technology (EIT) Awareness Days, Ricasoli, SmartCity Malta, 28 - 29 November 2013

Presentation. Topic: **Water as strategic issue and economic opportunities in Hungary**, “Spring Wind Conference 2013”, Conference of the National Association of PhD Students Sopron, Hungary, 31 May – 02 June 2013

### **Climate-KIC “Winter Journey”**

12 November – 14 December 2012 (Netherlands, Hungary, Poland)

Five-week intensive climate innovation school

Climate-KIC - a European network of innovators working together to address the challenge of global climate change (partnerships between business, academia and public entities)

Presentation. Topic: **The role of the sewage water and sludge in the sustainable water management**, Climate-KIC Winter Journey, Delft, Holland, 23 November 2012

Presentation. Topic: **Green Fuel Solution**, Climate-KIC Winter Journey, Wroclaw, Poland, 13 December 2012

## Participation in Professional Organizations

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Member of the Hungarian Atlantic Council

Member of Climate-KIC Alumni Association

## Education

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September 2010 - On-going **PhD at the National University of Public Service, Doctoral School of Military Sciences, Budapest, Hungary**  
Safety Studies of Science  
Awaiting thesis completion

1997 - 1999

**MSc. in Economics**

**University of Economic Sciences of Budapest, Hungary**

- Specialising in International Relations
- Majoring in Foreign Affairs and European Union Studies

1993-1996

**BSc. in Business Administration**

**ESIAME-BUDAPEST French Business College**

(Ecole Supérieure pour l'Innovation et l'Action vers les Métiers de l'Entreprises), Member of the ESSCA Group  
Budapest-Angers-Cholet

- Majoring in Commercial and Marketing Studies

**Languages**

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**Hungarian:** Mother tongue

		Understanding		Speaking		Writing
		Listening	Reading	Spoken interaction	Spoken production	
<b>English</b>	Fluent					
	Independent user	C1	C1	B2	B2	B2
<b>French</b>	Fluent					
	Independent user	B2	B2	B1	B1	B1
<b>German</b>	Basic user	B1	B1	A2	A2	A2

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user  
Common European Framework of Reference for Languages