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Network Centric Warfare as Complex Optimization: An Evolutionary Approach

Zoltán JOBBÁGY[1]

Military operations are very complex undertakings. However, complexity is not a feature unique to military operations. When biologists wanted to understand the properties of gene mutation they also faced complexity. Confronted by a large number of genes featuring different characteristics, a difficult-to-decode interaction among those genes, and an environment that could not be excluded as a factor, Sewell Wright introduced the shifting balance theory, also known as the theory of the fitness landscape. The theory allows complexity to be seen as a process that rests on adaptation and mutation. These two processes are also central to military operations as it is imperative to offset the changing conditions coming both from the environment and the interaction with the enemy. In the article the author uses Wright's theory to help see military operations as a complex optimization problem that includes approximations and estimations regarding optimal values.

Keywords: *network-centric warfare, complex optimization, biological evolution, fitness landscape, adaptation*

Military Operations and Networking the Force

Military operations are very complex undertakings, a fact which is also reflected in various official NATO documents. Allied Joint Publications are full of statements that the complex nature of military operations does not allow for simple definitions nor lends itself to simple analysis. Complexity of military operations means that relationships between causes and effects are very hard to detect and even harder to predict. This complexity very often precludes the definitive defining of desired effects. [3: 2–11] Due to the complexity of military operations many force employment concepts have been created over the years. [27: 6–16] A more enduring among them appears to be *network centric warfare*, which defines a new relationship among individuals, platforms, and organizations. Proponents of the concept assume that a networked force can result in processes that create more appropriate behaviors and modes of operation. Networking also promotes the effective linking of dispersed and distributed entities of a warfighting organization thus increasing combat power. In general, network-centric warfare for them stands for synergy, dynamically reallocated responsibility, and successful adaptation to the situation. Thinking in terms of networks shifts the focus on the interactions among entities as the emphasis is on information flows, nature and characteristics of the entities, and the way those entities interact. Network-centric warfare allows the entities to work in concert in which they act as nodes and process information by passing it from one to another. [1: 87–95]

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Proponents also assume that network centric warfare can help eliminate stove-pipe legacy systems, parochial organizational interests, redundant and non-interoperable military systems, and optimize investments for information technology systems. Due to its horizontal focus the concept stands for doing what needs to be done without traditional orders. It provides for an improved understanding of the higher command's intent, a better understanding of the operational situation at all levels, and an increased ability to tap into the collective knowledge, in order to reduce fog and friction normally associated with war. [29: 2] Network centric warfare thus offers many benefits such as enhanced combat power, better shared awareness, and increased speed of command, higher tempo of operations, greater lethality and better survivability. Central to it is a rapid decision making process and an increased speed of execution. All benefits of network centric warfare come from the shift from individual platforms to the network they can provide for, from independent actors to a continuously adapting *ecosystem* the actors are part of, and from making and executing strategic choices to adapting in those ecosystems should changes occur. [24: 3–6] [14: 245–256]

Military operations can indeed be seen as *warfighting ecosystem* in which the human organizations involved create a unique, highly complex and dynamic environment. In such complex situations, as one Allied Joint Publication states, pragmatism, experience and a good sense are required to achieve desired effects. [1: 83] [4: 1–7] Complex situations found in military operations require a proactive engagement and the careful coordination of sensitive responses. Complexity calls for sophisticated and non-linear models as military operations contain elements existing simultaneously, each coming to the surface at certain times. For a better understanding of complexity and the full realization of network-centric warfare an approach is needed that emphasizes decentralized command, freedom of action, tempo and initiative. Only this way can it be assumed to be possible to contend with the multitude of activities in dynamically changing situations as presented in military operations. [5: 1–9] [13: 659–671]

In order to better understand the complexity of military operations the author uses biological evolution as a basis. Exploring certain features of evolutionary biology by taking advantage of one of the central theories of population genetics can serve as a good vehicle to comprehend this complexity. Thus the author first explores the shifting balance theory according to which biological evolution is seen as a process that happens in networks. Then he details certain features of the internal dynamics of adaptation as it happens in such evolutionary networks. Following this the author examines how evolutionary adaptation can be fine-tuned in order to be successful. Then he goes over to detail evolutionary adaptation as a process that happens as a result of co-evolution. The article ends with the conclusion.

Shifting Balance of Evolutionary Networks

Complexity and networks are not features unique only to military operations. When biologist Sewell Wright wanted to understand the properties of gene mutation he also faced a complexity comparable to what is found in military operations. He was confronted by a large number of genes featuring different characteristics, a difficult-to-decode interaction existing among those genes, and the environment that could not be excluded as factor. In order to handle this problem Wright showed, as demanded by one Allied Joint Publication, pragmatism, experience and good sense. He introduced the *shifting balance theory*,

also known as the theory of the *fitness landscape* in which fitness describes the relative success of a species in relation to others in the environment. Similar to the unpredictable character of military operations also biological evolution happens in a constantly changing environment in which a species' suitability to the circumstances often alters in a subtle and dramatic way. [30: 3] [6: 66–75] [12: 40–41] [25: 268–279] His theory is a powerful aid to conceptualize a complex phenomenon such as biological evolution in a novel way. Wright's approach allows biological evolution to be seen as a process that rests on adaptation and mutation. These two processes are also central to network centric warfare as it is imperative in military operations to offset changing conditions coming both from the environment and the interaction with the enemy. Thus Wright's approach has much to say for network centric warfare too, as he proposed the evolutionary process to be a network composed of various genetic combinations. His theory can help understand military operations as a *complex optimization problem* that includes approximations and estimations regarding optimal values. In a similar way NATO publications also state that the way complex problems are framed in military operations has become more important than ever. Complexity demands principles aimed at gaining an understanding for better adaptation, rather than just simply executing orders. [26] [16: 389–396]

In order to solve his complexity problem Wright constructed a graphic representation, a short and non-mathematical approach to biological evolution that resembles a certain similarity with a topographical map. Although he emphasized that references to geography are of secondary importance, the result was a map containing multiple peaks surrounded by circular contours. The map was defined by two axes representing the dimensions along which possible combinations could be arranged. Every combination had a certain value and by connecting the points of equal value contours of peaks and valleys arose. (Figure 1) [6: 67–68] [31: 165–172] [32: 115–116]

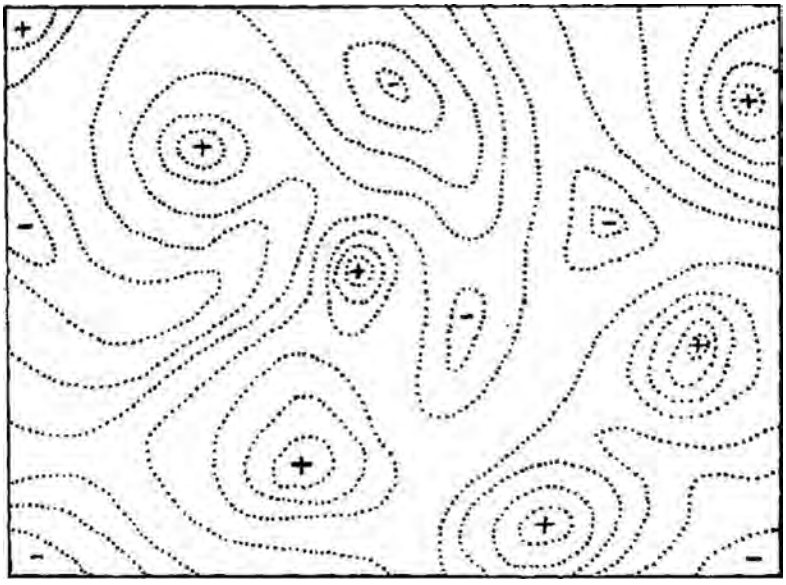

Figure 1. A diagrammatic representation of the field of gene combinations in two dimensions. Dotted lines represent contours with respect to adaptiveness. [30: 3]

Wright assumed that evolutionary selection could carry the species to the top of the nearest peak, but could not cross valleys that separate the current peak from other, probably higher ones. However, should the species be able to cross valleys then it is not under the exclusive control of natural selection, but of a certain trial-and-error mechanism. An indefinitely large species that lives under constant environmental conditions and is exposed only to natural selection can reach equilibrium by occupying a certain peak. The population either grows through an increase in mutation rate or a decrease in mass selection, or it decreases through the opposite process. In both cases evolutionary selection alone does not seem to be sufficiently strong to push the species towards another and possibly higher peak. [30: 360–362] [32: 117]

Wright assumed that the environment is never static, but changes continuously. The landscape constantly deforms by depressing high places and elevating low ones. According to him, if a species is not extremely specialized and occupies a wide field on the landscape, by moving constantly it can find higher general regions. Such a trial-and-error mechanism can shuffle the species about by means of change without advance in adaptation. As a solution he proposed a large species to be subdivided into many local races that shift continually in a non-adaptive fashion on the landscape. Although this exploratory process could result in a decrease of fitness as an immediate effect, this way it would become possible that at least one local race finds a higher peak and pulls the entire species towards this better position. Wright emphasized that a subdivision of a species into local races provides the most effective adaptation mechanism for trial and error in the field of gene combinations. In other words, he proposed adaptation to be most effective when being networked. (Figure 2) [30: 363]

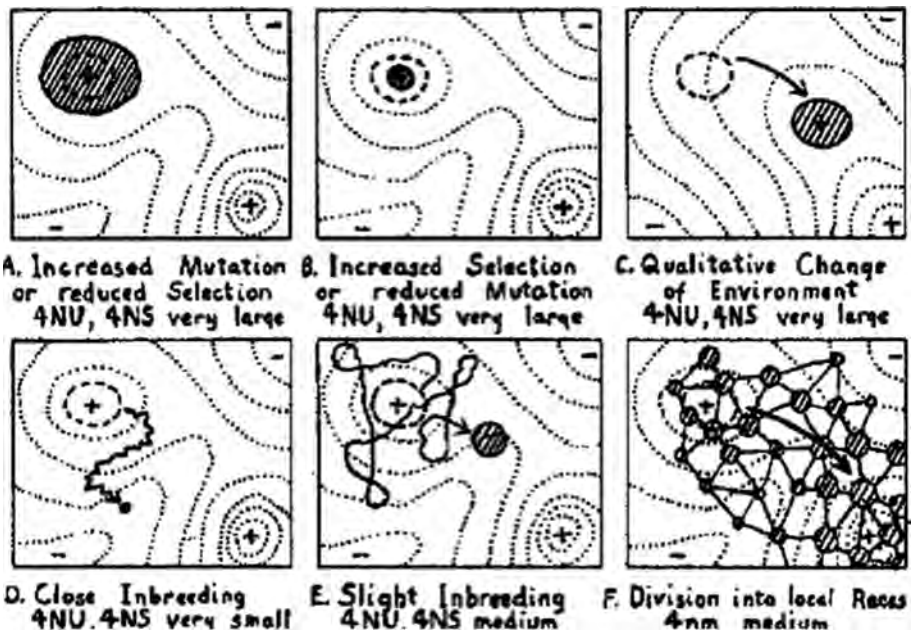

Figure 2. Field of gene combinations occupied by a population within the general field of possible combinations. [30: 6]

Wright's conclusion was that evolutionary adaptation involves differentiation in which the principal mechanism is essentially non-adaptive. Wright regarded evolution as a dynamic process in which adaptation comes as a result of a careful balance between natural selection and random genetic drift. In this process each has varying contributions to the survival and extinction of species over time and space. He proved that adaptation and chance events play an important role in biological evolution. [30: 362–366] [6: 68–72] [32: 118]

Evolutionary Networks and Adaptation

Backed by computer power Kaufmann and Levin picked-up Wright's idea and examined its internal dynamics in detail. They stated that evolutionary adaptation in the framework of genetic networks is composed of small changes. Its mechanism resembles and has similarities with a constrained local search process in the form of an *adaptive walk*. They also stated that evolutionary adaptation deals with conflicting requirements that always limit the end result. They assumed a landscape featuring many peaks and valleys in which adaptive walks proceed along a path leading to attainable local or global peaks. They regarded adaptation as the simplest form of optimization and also the simplest form of a trial-and-error mechanism. Similar to Wright they saw evolutionary change as a novel and creative process that may or may not be accompanied by adaptation to the constantly changing conditions of the environment. They proposed adaptation and fitness to come from the environmental context displaying an extended web of relationships in the form of conflicting constraints. [18: 12–15] [20: 163–166] [9: 222–230] [9: 245–254]

As a baseline case they first examined adaptation on uncorrelated fitness landscapes. In such landscapes they suggested drawing the fitness value of each entity randomly from a given, but fixed underlying distribution. Kaufmann and Levin used N genes where each gene could have only two values, 1 standing for gene activated and 0 for not activated. The number of possible combinations is 2^N with 1 being the lowest value and 2^N the highest. Connecting the 2^N points with lines results in landscape-like surface, which is very rich in peaks or local optima. According to them the number of such local optima increases almost exponentially to N resulting in an uncorrelated landscape of which the expected lengths of adaptive walks are generally very short. Each successive step on average moves halfway from the current point, towards the point with the maximum value. After each step the expected number of fitter points is halved on average. The result is that the stopping times are distributed very tightly. In such a setting the great majority of adaptive walks stop within one or two steps. The number of alternative pathways leading to higher optima decreases linearly with the rank order of the points. Consequently, with an adaptive walk from any single starting point only a small fraction of the true local optima is accessible. [18: 19–21] [20: 167–169]

Kaufmann and Levin argued that the success of an adaptive walk depends on the correlation structure of the landscape. A point with an initially low fitness has many fitter neighbors, a point with high fitness has just few and a point that is a local optimum has none. In such a landscape an adaptive walk can branch into many alternatives early in the process, but the number of alternatives slows down as fitness becomes higher. Their conclusion was that adaptation on an uncorrelated fitness landscape favors branching radiation that slows ultimately to stasis. (Figure 3) [18: 22–24]

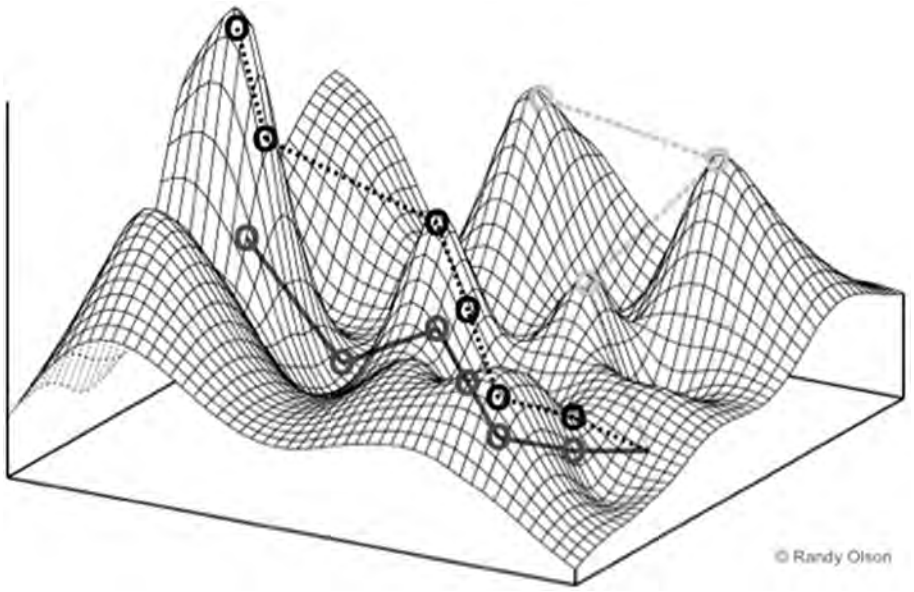

Figure 3. A three dimensional landscape featuring many peaks and valleys in which adaptive walks can lead to attainable local or global peaks. [28: s.p.]

According to Kaufmann and Levin most fitness landscapes are correlated in which points with similar values are closer to each other. The result is that neighboring points, which they called 1-mutant fitter variants, show similar properties. Correlated fitness landscapes can also be rugged and may require long-jump adaptation to distant points, also called J-mutant fitter variants. In this case the importance of a local optimum disappears since all points become accessible. As a result the correlation structure becomes weaker and weaker, and the number of local optima diminishes. On such landscapes the importance of the expected waiting time increases as jumps sufficiently far represent adaptation that experiences an uncorrelated landscape. Similar to an adaptive walk they assumed that if more than one J-mutant fitter variant is found the fittest is chosen. Thus on average, a single J-mutant fitter variant lies halfway between the least fit and the fittest; therefore the waiting time to find the next fitter variant doubles with each successive step almost independently of the population's size. Adaptation via J-mutant fitter variants is rapid at the beginning, then slows down and after a modest number of steps stasis sets in. Similarly to adaptation via 1-mutant fitter variants branching into alternatives is more common initially, but progressively harder later. Adaptation via J-mutant fitter variants also tends to prefer branching radiation that eventually quiets to stasis. [20: 619–622] [18: 26]

Later Kaufmann assumed that correlated landscapes might exhibit self-similar characteristics resulting in small hills nestling into the sides of larger hills, which again nestle into the sides of much larger hills. Consequently, landscapes can be correlated, but rugged. After a jump with a distance shorter than the maximum the species may land on an uncorrelated landscape when measured on a shorter length scale, but on a correlated landscape when measured on a longer length scale. [21: 572–577] [20: 171–175] Using the insights coming from the two baseline landscapes and the two sorts of adaptation, it became possible for them to derive

some generalizations for adaptation on correlated landscapes. Kaufmann and Levin argued that it makes sense to marry the local and global search in adaptation depending on the time scale of the process. Most statistically rugged landscapes are correlated, and adaptation via J-mutant fitter variants may possibly escape the correlation structure, which is not possible with adaptation via 1-mutant fitter variants. Given a randomly chosen point on the landscape with an average fitness, in the beginning the population would sample both in the vicinity via 1-mutant fitter variants and further away via J-mutant fitter variants. Since the fitness is average, half of the points sampled will be fitter and half less so. Due to the correlation structure, points sampled nearby will only be slightly fitter, whereas points further away and not constrained by the power of correlation could reveal much higher fitness levels. Thus early in the process long jumps trying to find J-mutant fitter variants would become dominant and result in a branching radiation. However, as more J-mutant fitter variants are encountered, the chance of finding J-mutant fitter variants will be less than finding nearby and only slightly fitter 1-mutant variants. Consequently, in the mid-term adaptation via 1-mutant fitter variants in the form of an adaptive walk or local hill climbing will dominate the process. However, as the process goes towards the peak, the rate of finding 1-mutant fitter variants decreases and the danger of ending up in stasis grows. Therefore in the long term, adaptation via J-mutant fitter variants will again make sense, since only with long jumps is it possible to land in the vicinity of a fitter point that can again be climbed. [18: 33–35]

Although evolution can be understood as a process composed of long jumps and adaptive walks uphill, after each long jump and hill climbing the time requirement for finding the J-mutant fitter variant is typically more than double. Consequently, radiation and stasis are inherent features of evolution. Early in the process many different pathways branch upward. As time passes fewer alternatives can emerge until single lineages get trapped on local optima. As local optima are approached the number of ways leading uphill decreases. On rugged landscapes radiation and stasis are utterly generic as adaptation stands for branching lineages that surf on a turbulent fitness sea with both divergence and convergence occurring at wavetops. [21: 577–580]

Fine-tuning Evolutionary Adaptation

Although in reality the contours of fitness landscapes remain unknown, they can be reconstructed in order to make them knowable. Based on the general insights gained above, Kaufmann developed a model, which is defined both by the variable N and another variable K. Variable N stand for the number of genes, whereas K stands for the average number of epistatic interactions or conflicting constraints within N that profoundly influences the fitness of any combination. Since K can be tuned from zero to a maximum value (N – 1), it basically defines the ruggedness of the landscape. As K increases, the landscape changes from smooth to very rugged, or from statistically correlated to statistically uncorrelated. [21: 540–543] [20: 169–171] [23: 301–302] In the case of K = 0 there are no epistatic interactions, no conflicting constraints and no cross-connections. The structure of the landscape contains only one global optimum, which makes an adaptive walk via 1-mutant fitter variants possible. This landscape is the simplest possible in which all points are on a connected pathway leading to the top. The surface is smooth with neighboring points having nearly the same fitness value. Thus knowing the fitness value of one point provides significant information about the fitness

value of neighboring points. On such landscapes for very large N the fitness values of 1-mutant fitter variants are very similar. In that case, walk lengths to the global optimum increase linearly with N resulting in the pace of such a walk being very slow. This smooth landscape perfectly reflects the ideal gradualism of evolution as outlined by Darwin. [20: 544–545] In the case of K = N – 1 the amount of conflicting constraints is maximum and each point is affected by all other points. The result is an entirely uncorrelated and extremely rugged fitness landscape. The fitness value of any given point does not give information about the fitness value of neighboring points. On such landscapes, the number of local optima is very large and the rate of finding better optima via 1-mutant fitter variants decreases at every step. Thus the lengths of adaptive walks to local optima are generally very short and the expected time to find a local optimum is proportional to N. Only a small fraction of the local optima is accessible from any given point. As the number of points increases, the fitness value of local optima falls towards the average fitness of the space, which limits the force of selection and the success of an adaptive walk. The fitness values of accessible optima become poorer as the peaks themselves decrease. [20: 173–175]

NK landscapes can thus have two baseline cases. Whereas the first equals K = 0 and indicates an entirely smooth surface, the other equals K = N – 1 and stands for an entirely rugged surface. [20: 546–547] However, there is an infinite variety of potential landscape surfaces between the two end-poles. Should K and N increase proportionately, the fitness of accessible optima becomes an ever poorer compromise. Such landscapes resemble isotropic features as high peaks move apart from each other in the landscape. Consequently, any one area looks roughly as any other area. Good peaks do not exist since it is not possible to climb higher peaks than afforded by the landscape itself. However, if K is small and fixed whilst N increases the landscapes display non-isotropic features and contain special regions in which high peaks cluster. The location of one high optimum gives information about the location of other good local optima. In this case it is reasonable to search for peaks that lie between two higher peaks that contain mutual information about possible good regions of the landscape. [22: 180–183] [20: 180–183] Originally the concept of NK landscapes was developed to understand evolutionary migration of *haploid gene combinations* that do not involve recombination, but happen if advantageous point mutations accumulate. However, recombination of *diploid gene combinations* helps improve the mostly myopic search process of an adaptive walk guided only by the local features of the landscape. Through recombination it becomes possible to get a bird's-eye view on the landscape, but also in this case success depends on the correlation structure. Consequently, on random landscapes recombination is useless and does not make any sense since it suffers the problems of long-jump adaptation. However, on correlated landscapes in which the highest optima are close to each other and peaks are largest, the location of any given high optimum carries information about other optima. Peaks contain mutual information about the good regions in which recombination can be compared with the effect of repeated long jumps. Thus recombination is a very powerful form of adaptation on very rugged, but correlated fitness landscapes. The only critical requirement is that local optima must carry mutual information about the location of other good or better optima. [21: 583–592] [21: 569] [21: 611] [10: 227–228]

It must also be mentioned that by approaching one of the two end-poles evolution suffers from two limits of complexity in the form of catastrophes. The first extreme refers to K = 0 in which the gradient leading to the single optimum is shallow. In this case selection is not

always able to hold the population at the peak and can become too weak compared with mutation. The adapting population cannot stay at the top of the peak, but flows down mostly in the form of quasi-species into the lower regions of the landscape. This phenomenon stands for large mutation rates that lead to a sudden breakdown of stability. Such a case is called the *error catastrophe*. The other extreme refers to K = N – 1, which indicates a very rugged landscape containing a huge number of peaks. Here, local optima fall towards the mean of the space. Consequently, walks are locked into typical local regions that have an average fitness value. In this case selection affords only poor peaks to be climbed. A shift towards this extreme results in a *complexity catastrophe*. [17: 068104-1-4] [11: 4481–4487] [21: 552–558] [21: 580–583] [21: 587–592] Given these two limitations, Kaufmann assumed that early in the evolutionary process adaptation occurs on a highly uncorrelated fitness landscape with a subsequent adaptation happening on a rather well-correlated landscape. Adaptation on a correlated landscape means that the rate of finding fitter variants can either stay constant as the fitness increases or decreases slower than on uncorrelated landscapes. In other words, history does matter since early development always locks in. [20: 177]

Evolutionary Adaptation as Co-evolution

In real life species live in niches afforded by other species, with the result that fitness landscapes are not fixed, but evolve due to interactions with other species. As Kaufmann argued, real evolution is a co-evolutionary process that happens on coupled landscapes in which the adaptive moves of one species deform the landscapes of other species. This implies epistatic interactions between the landscapes themselves, since in reality the fitness of each species depends both on the environment and other species. Consequently, landscapes of co-evolving species show a very dynamic surface that trembles, waves and heaves. In such a situation all bets are off since attempts of one species to improve its own fitness may deform the landscape of the other species to which it is coupled. Although the fitness landscape of any given species is a function of the adaptive moves of other species since they correspond to the changes, it cannot be excluded that certain aspects of fitness might be independent from interactions. In order to catch the essence of the co-evolutionary process Kaufmann introduced two new variables, C and S. Variable C describes the epistatic interactions between the landscapes and represents those external constraints that influence a species' fitness. Increased C shows how the adaptive moves of species deform the landscapes of their partners. Variable S stands for the number of interacting species, hence the number of different fitness landscapes. Thus the variables tune the landscape's ruggedness and also model the richness of external conflicting constraints. [21: 675–688] [20: 215–222] [19: 325–369]

Similar to fixed NK landscapes, there are also two end-poles on co-evolutionary landscapes. Whereas one end-pole is called *evolutionary stable strategy*, the other is called *evolutionary unstable strategy* also dubbed the Red Queen. In an evolutionary stable strategy each species climbs to a peak that is consistent with the peaks on the other species' fitness landscape. Under this condition the species stop co-evolving because each is better off not changing as long as the others do not change. [8] At the other extreme the species never settle down, but keep chasing peaks forever. Their effort to deform and lower the peaks on the other species' landscape also alters indirectly their own. Consequently, the behavior lies in the chaotic domain in which the species run ever faster in order to stay in the same place. For

cases in between Kaufmann found that species can co-evolve well. The speed at which species move depends on their current fitness and the ruggedness of the respective landscapes. If species are on landscapes of different ruggedness the rate at which they move uphill depends on their joint fitness and landscape ruggedness. When the amount of coupling between the landscapes is high, by increasing the number of conflicting constraints internally, a species can reach equilibrium faster and gain higher fitness. [21: 689–702] [20: 223–225] Kaufmann concluded that for $K > C$ equilibrium is encountered more rapidly than for $K < C$ where the waiting time can become very long. For co-evolving species $K = C$ is a crude dividing line for the time requirement to encounter equilibrium. In the case $K > C \times S$ the co-evolving partners all get to equilibrium rapidly; in the case $K < C \times S$ equilibrium can only set in after a long period of time. Thus the fitness in co-evolving systems increases when a species can adjust its K to C with $K = C \times S$ being a rough guide. [19: 334–343] [15]

Conclusion

The shifting balance/fitness landscape theory indicates that biological evolution is full of results that feature potential outcomes rather than planned ones. Moreover, as the distribution of these potentialities overlap approaches attempting to *optimize* make more sense than those attempting to *maximize*. Thus success and victory in the form of life and death, survival and extinction, can be seen as emerged positive and not as realized maximum outcomes. The greater the uncertainty the greater the possibility, that factors such as relative superiority and fortuitous circumstances become decisive. Chance events often demand from species to work in a trial-and-error modus. In biological evolution there is no guarantee that a particular outcome is really the best one. Once chance forces the selection of a particular path a species often locks in regardless of the quality of other possibilities. Complexity indicates that there are many possible solutions to the same problem and often small, fortuitous, and trivial events determine the one event that becomes dominant. [2: 211–221] [7: 92–99]

The evolutionary analogy, however, has many benefits for the concept of network centric warfare as well, as it:

- highlights the dynamic processes of military operations as options that can help create more appropriate behaviors and modes of operation;
- promotes the effective linking of dispersed and distributed entities of a warfighting organization into an organic whole;
- helps better understand the relationship between those entities on various scale (individuals, platforms, organization);
- shifts the focus toward the interactions of the entities by delivering means to better understand the underlying dynamics;
- promotes the collective knowledge of the entities to reduce fog and friction traditionally associated with war;
- enhances the combat power of those entities on various scale and increases their common operating picture;
- emphasizes the importance of information flows, clarifies the nature and characteristics of the entities, and the way those entities interact;
- underlines the importance of synergy, dynamically reallocated responsibility, and successful adaptation;

- allows the entities to work in concert to help them act as nodes that process information by passing it to another;
- contrasts legacy systems that reflect bureaucratic stove-pipe thinking and parochial organizational interests;
- replaces redundant and non-interoperable military systems by fostering investments for new information technology;
- provides for an improved understanding of the internal dynamics of military operations to gain a better understanding of the situation at all levels;
- increases speed of command, contributes to higher operational tempo, greater lethality and better survivability;
- emphasizes a horizontal focus that fosters decentralized command, freedom of action, and bottom-up initiative;
- displays adaptation in military operations as a process that is composed of small changes and features conflicting requirements;
- regards adaptation as a simple form of optimization and a simple form of a trial-and-error mechanism;
- emphasizes military operations as a novel and creative process that cannot be isolated from the environment's constantly changing conditions;
- proposes operational adaptation to be influenced also by the environment that displays an extended web of conflicting constraints;
- sets with the two baseline cases (NK landscape with $K = 0$ and $K = N - 1$) clear limitations for the power adaptation;
- displays adaptation as a search process that features both local and global characteristics and points to the necessity for information and innovation;
- suggests that adaptation in military operations is most successful when it correlates with the characteristics of the environment;
- emphasizes military operations as a co-evolutionary process in which increasing the number of conflicting constraints internally can result in better adaptation;
- makes clear that despite their strive for order and equilibrium military organizations need to tolerate messiness and disorder in operations;
- emphasize the need to make the shift from the traditional plan-and-execute approach toward learning and adaptation;
- makes clear that interaction with the enemy (NKC landscapes) produces feedback effects that have emergent characteristics;
- highlights that feedback effects produced in the co-evolutionary process with the enemy has clear limitations in terms of planning and execution.

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A Hidden Corner of the "One Health" Concept: One Health, the Military Veterinarian, and Education

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Public health belongs to the "One Health" umbrella. As military veterinary medicine evolved, it became embedded in national security. Many armed forces still have active veterinary services, both regular and reserve components. The military veterinarian can serve as an interface between civilians and civil organizations, can handle complex and interdisciplinary cases. Introducing the "One Health" concept both in practice and education has encountered many difficulties. Over time, "One Health" has been judged to be a "buzz word" in civilian areas; however, it is a weighty concept. Its importance is pronounced in military areas where practicing along One Health principles were present before the appearance of the term itself. Nevertheless, military "One Health" has not penetrated into the overwhelming "One Health" literature. Emphasizing the military aspects of One Health not only reveals an obscure corner but might help to regain the proper importance of the "One Health" concept.

Keywords: *"One Health", public health, veterinary, military, armed forces*

"One Health" Concept

The "One Health" concept, articulating the interactive "health triangle" of humans, animals, and the environment, is widely acknowledged and supported by veterinary legislation and organizations. [1] [2] [3] [4] [5] [6] [7] [8] The Global Health Security Agenda launched by the USA and endorsed by more than 40 countries also stresses the "One Health" approach. [4][9]

Under the umbrella of the "One Health" concept veterinarians control zoonoses, foodborne pathogens, chemical residues, risks due to companion animals to ensure safe animal products and food for human consumption, and to improve the health of people. [3][8][10] Embedding the "One Health" concept in veterinary curricula, collaboration between veterinarians, physicians and other scientific health and environmental professionals, facilitating student-driven initiatives, improving leadership and management skills, spreading information and attracting people to postgraduate education via new communication ways are considered to be ultimate goals. [5][11]

According to the American Veterinary Medical Association, out of the 1461 diseases recognized in humans, almost 60% are due to multi-host pathogens. Over the last three decades,

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approximately 75% of new emerging human infectious diseases have been zoonotic. The most effective and cost-effective way to protect humans is to control disease in the animal host. [12] According to the World Health Organization (WHO) environmental hazards account for 25% of the total disease burden worldwide. [13] Several authors list the top factors of a successful "One Health" strategy that comprises the equilibrium between the quality and cost of health. (Table 1)

Crisis situations effectively induce the adaptation of organizational structures; however, we should not wait for crises. For example, in Europe, the annual zoonoses report is jointly issued by the European Food Safety Authority (EFSA) and the European Centre for Disease Prevention and Control (ECDC). These agencies are increasingly collaborating around outbreaks, e.g. the emergence of Schmallenberg virus. Vector-borne diseases are also good candidates for the "One Health" approach. [9]

Considering local and regional socio-economical features are key issues for a successful "One Health" implementation. Within this, three stages can be identified. In stage one areas the focus point is "food security", at stage two it is "food safety", while at stage three the principal aim is "food acceptance" where veterinary public health has undergone evolution and has become preventive population medicine. [3]

Stage one and/or underserved communities require more attention to successfully implement "One Health" actions worldwide. One example for such communities is the mobile pastoralist community in Chad. Health service is not the only priority there; the safety of livestock, access to pastures and water, personal (in)security, lack of access to education are also huge problems. Health and "One Health" issues cannot and should not be separated from the above problems. The holistic approach [12] combines public health and nutrition, animal health and food security, resource access and pastoral security, and basic education and information in a "minimum packet of services" that would be available in each area where nomadic communities occur. This service should be flexible and should follow seasonal variations and pastoral movements. [17]

The White Paper on Food Safety of the European Commission [18] stresses the role of veterinarians and veterinary services in public health. Rubin et al. [16] states that human medicine is traditionally engaged in "One Health" while the leadership is predominantly drawn from animal health sector. The third sector, wildlife health/wildlife management is the one that struggles most with the "One Health" concept since it primarily focuses on human health, secondarily on domestic animal health, while wildlife health and ecological health is considered to be an afterthought. [16]

As Uchtmann et al. points out "a future 'One Health' surveillance system should unify the efficiency of public health, the depth of human medicine, the breadth of veterinary medicine, the expanse of ecology, the practicality of economics, and the wisdom of peacemaking." [14: 13] More than 100 years ago medical training was broad. Later on, specialization advanced and medical and veterinary sciences became separated; [9] [19] and veterinary medicine was shifted to the agricultural sector. One health requires the reunion or at least the increasing overlap of these two medical branches. [9] [20] Moreover, both branches should concentrate more on public health, emerging and re-emerging diseases and environmental management. [12]

Collaboration between human and veterinary medical experts is hindered by many factors; not only by precautions but the separate data recording systems. One example of a joint

database is the Global Early Warning System **(**GLEWS) which is gathered by the Food and Agriculture Organization of the United Nations (FAO), the World Organization for Animal Health (OIE) and WHO, and confirmed by the national authorities. In Egypt, Vietnam and Indonesia, so-called "4-way linking" platforms were established: a joint public health-animal health risk assessment based on data from epidemiology units and laboratories. In Canada, information on risk factors prevalence and resistance data for enteropathogens are collected along the food chain including animal and human sampling. This integration yields enhanced early detection of emerging threats. [9]

"One Health" Concept and the Military Veterinarian

Public health is increasingly considered a national security issue. National security information is expected to be accurate and timely so such issues can be quickly elevated to the highest levels of government. [21] Public health got embedded in national security when military veterinary medicine evolved. General George Washington demanded a farrier for a regiment of horses in 1776, in the USA. [22] Up until the end of the First World War, horses and other animals were commonly ordered to the battlefield or to the supplying regiments. By the late-19th and early-20th centuries, veterinary corps appeared in national armed forces to protect and treat military animals. For example, in the Republic of Korea Army, Veterinary Corps were integrated in the Army Medical Department in 1948. Their mission was to provide food safety and inspection services, zoonotic disease prevention and control; laboratory animal medicine works for medical research support, clinical veterinary service for government owned animals. [23] (Table 2) When mechanized warfare spread, the majority of service horses were retired, and the supporting veterinary corps were often disbanded. [24]

Many armed forces still have active veterinary services, both regular and reserve components, such as the United States Army Veterinary Corps and the Royal Army Veterinary Corps (UK). Both International Security Assistance Force and North Atlantic Treaty Organization (NATO) have used veterinary programs in Afghanistan. However, military veterinarians are also applied in Domestic Operations such as in case of disasters. The Canadian Veterinary Medical Association established the Canadian Veterinary Reserve (CVR) as a civilian tool for emergencies. Noteworthy, it was formed to give the Canadian Food Inspection Agency an extra capacity for a foreign animal disease outbreak. [24]

In the USA, the former U.S. Army Veterinary Command (VETCOM) and the former U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) was merged and the U.S. Army Public Health Command (USAPHC) was formed in 2011. The mission statement for this new command is "to promote health and prevent disease, injury and disability in soldiers and retirees, their family members, and Army civilians and to assure effective execution of full-spectrum veterinary services for the Army and Department of Defense". [25: 1] This induced the embracing of the One Health concept in the military. The USAPHC started to elaborate a Zoonotic Disease Report (ZDR) in the same year. ZDR combines zoonotic disease risk assessment and zoonotic disease data from human, entomological, laboratory, and animal data sources; however, animal disease data is currently limited to that available from public data sources. [26]

According to Burke [4] the US army is uniquely positioned to implement the "One Health" concept since it applies health personnel from all the three disciplines (medical, vet-

erinary, and environment) to protect and promote health. The awareness of the "One Health" concept and the often stovepipe-like organizational structure are identified as weaknesses. In case of deployment, medical personnel need – preferably joint – training to accomplish missions that are non-traditional for their career field and must have knowledge about other mission requirements and gaps in responsibilities. So the creation of USAPHC is not enough by itself. Awareness must be increased and predeployment training is inevitable. However, not all responsibilities can be shared between disciplines because certain functions require special training and certification e.g. pasteurized milk audits. Another opportunity to promote the One Health concept is the U.S. Army Medical Department (AMEDD) Basic Officers Leaders Course (BOLC).

The spectrum of USAPHC's public health responsibilities is broad: beyond humans, it includes animals and the environment, where some of the causes of human diseases, injuries and disabilities originate; unsafe drinking water, spoiled food, ineffective sanitation measures, mold in the workplace etc. The emphasis in Army Medicine should be shifted towards prevention and USAPHC is a key organization in the above process. [25]

In USAPHC, many military veterinarians serve. According to the US Army Field Manual 4-02.18, Veterinary Service Tactics, Techniques and Procedures the three main functions of the military veterinarian are:

- food safety, food security, and quality assurance;
- veterinary medical care;
- veterinary preventive medicine. [27]

All these veterinary functions in fact express the One Health concept. [24]

The modern military veterinarian can employ the above three functions in support of three broad military roles:

- support to conventionally-deployed forces;
- support to civil authorities;
- support to operations other than war. (Table 3)

The military veterinarian can serve as an interface between civilians and civil organizations assisting with disasters, can handle complex and interdisciplinary cases and also can help his/her liaison with orienteering in the specific, often emotional environment around pet animals and livestock. [24]

Military veterinarians often work with local communities within an area of operations, provide basic training to local veterinarians and farmers, and facilitate the delivery of products (e.g. vaccines, de-worming medicine). The improvement in overall conditions of the people and the society can result in a shorter period between the commencement of military operations and the handover of a secure area of operations to civilian authorities. Such projects can be relatively inexpensive and short-term, but can also yield long-lasting benefits. [24] Military veterinarians also help in obtaining horses, mules and donkey from local stocks [22] [24] [28] and have a key role in caring for military working dogs (MWD) [29] and using them as sentinels for different zoonoses such as Lyme borreliosis. Evans [26] found strong positive correlation between military human borreliosis data and military pet dog Borrelia burgdorferi seroprevalence data by location in a pilot study.

Within NATO, the Committee of the Chiefs of Military Medical Services (COMEDS) has the authority to develop and maintain medically-related standardization agreements. One of the expert panels is the Food and Water Safety and Veterinary Support Expert panel

(FWSVS), charged with "initiating and developing common principles, policies, doctrines, concepts, procedures, programs and techniques for advice to COMEDS and for standardization and coordination in order to enhance interoperability within food and water safety, environmental health, and for veterinary medicine aspects, in the operational environment". [4: 1] NATO has recently ratified a revised Standardization Agreement (STANAG) that covers all aspects of the food chain from the audit of food processing establishment to the inspection of catering operation on the battlefield. STANAG 2556 includes three standards. [30] [31] [32]

At the flooding of the Indus river in Sindh Province, Pakistan, one of the initial preventive medicine issues was an Occupational and Environmental Health Site Assessment (OEHSA) for each of the 3 USA military base camps to identify health threats (such as exposure to arthropod, particularly mosquito-borne diseases) and develop recommendations to minimize their potential impact on US service members. Medical personnel must frequently cover gaps and undertake responsibilities traditionally performed by other personnel having other military occupational specialty. [33]

Veterinary Public Health Education

Incorporating the "One Health" concept in veterinary curricula supposes versatile veterinary training. However, the idealistic picture of the omnipotent veterinarian has been questioned in the past decade. [34] Halliwell [35] argues that veterinarians should remain omnipotential (rather than omnicompetent) so as to be able to change their scope later in their career; however, on an institutional level, covering all aspects of veterinary medical education might lead to mediocre instruction. To avoid this, establishing collaborative programs are needed. [11] [35] [36] [37] [38]

Ortega et al. [39] also emphasizes that the role of veterinarians is transforming from "traditional animal doctors" to "quality assurance managers" and "VPH policy negotiators" and the need of reflecting such changes in veterinary curricula. Many international organizations elaborated the list of core areas, minimum requirements and skills for veterinary medical education. Those areas according to the World Veterinary Association:

- disease control (both for domestic animals and zoonoses);
- food inspection;
- safety of food of animal origin;
- animal health and welfare;
- research on topics related to animal health, animal welfare and public health". [40]

Rubin [16] added leadership, communication, and organizational management skills as core competences to "One Health".

The American Veterinary Medical Association Council on Education specifies veterinary curricula should include "instruction in the principles of epidemiology, zoonoses, food safety, the interrelationship of animals and the environment, and the contribution of the veterinarian to the overall public and professional healthcare teams". [41: 1] To satisfy societal demands, Smulders et al. [42] highlights that veterinary professional curricula should be reviewed and FH/VPH elements should be upgraded.

The main duties of Public Veterinary Services should also be considered when designing/updating veterinary curricula: "improved animal health, leading to increase in the quality and quantity of animal protein production and decrease in poverty and malnutrition; public

health, including prevention and control of zoonoses transmitted by animals and foods; international veterinary certification, for better access to regional and world markets (including for certain populations of nomadic livestock keepers); the prevention and control of any potential use of animal pathogens in bioterrorism; the protection of animals, biodiversity and the environment." [43: 18]

Specific "One Health" courses and graduate programs that merge technical and leadership/networking training were launched mostly in the past 5 years. Graduates are expected to be employed around outbreak investigations or in the area of public policy. [9] In London, an MSc in "One Health" (Infectious Diseases) program is offered jointly by the London School of Hygiene and Tropical Medicine and The Royal Veterinary College in London. The University of California – Davis launched the Calvin Schwabe "One Health" project that aims to develop a new generation of veterinarians gaining "One Health" experience during their studies. [44] At the Royal (Dick) School of Veterinary Science, University of Edinburgh, United Kingdom, in the bachelor degree program an "Animal health, welfare and food safety" module is offered. After the bachelor degree, a Program for Master's degree in "One Health" (with a "Zoonoses and emerging diseases" module) can be completed. [45]

Bellemain [46] highlights that about 10% of the veterinarians are involved in areas related to Public Veterinary Services activities worldwide yet most of them are not expected to take part in specific training. Therefore key concepts and tools of public veterinary services (e.g. links between veterinary services and stakeholders, importance of the veterinary monitoring of slaughterhouses) should be incorporated into veterinary curricula. After graduation, post-recruitment initial trainings and Continuing Professional Development (CDP) might help to complete and maintain those competencies. [47]

Education for Veterinary Corps Officers

Veterinary medicine evolved from para/military education worldwide. For example, in Turkey, civil veterinary education started in 1871 at the Military Academy. Later on, the first Civil Veterinary School was founded in 1889. [48]

In the AMEDD the duties of different Corps are usually clearly differentiated. However, food inspection is an exception since it is performed by both veterinary and preventive medicine personnel. Before entering into military service, officers complete 4 to 8 or more years of formal education. Additional Corps specific training and/or annual professional continuing education is also completed. [4]

Torring and Mey [49] introduced a First Year Graduate Veterinary Education Program (FYGVE) that aims to prepare newly commissioned Veterinary Corps officers (VCOs) for the wide variety of technical and leadership challenges that occur at their first military duty location. VCOs should have broad, well-established, and practice-oriented training to:

- "ensure food safety, wholesomeness, and related quality assurance standards;
- perform inspections of operational rations and other service-owned subsistence;
- perform sanitation audits of commercial facilities that produce food for Department of Defense procurement and military food establishments;
- perform risk-based evaluations of food sources in a deployed or austere environment;
- evaluate laboratory test results pertaining to submitted food samples". [49: 39]

Although veterinary graduate programs include training in microbiology, virology, and epidemiology; they contain "little to no specific food safety training". [49] [50] The FYGVE program curriculum includes hands-on experience in: sanitation audits, operational food and water risk mitigation and installation-level food protection, veterinary medical care, veterinary preventive medicine, and the veterinarian's role in the "One Health" concept (topics include zoonotic diseases, installation rabies board policy, bite reports, foreign animals diseases, response to refrigeration failures, human-animal bond, inspection of operational rations etc.). The program also comprises a leadership curriculum with the following topics: interpersonal skills, team dynamics, cultural awareness, military and civilian resource management, resources for leadership challenges. The program is launched in different locations across the US. [49]

Summary

"One Health" appeared at the beginning of the 2000s and has been developed as an umbrella concept embracing human health, animal health and the environment. Global disease statistics underline the importance of the concept: almost 60% of human diseases are due to multihost pathogens, 75% of new emerging human infectious diseases proved to be zoonotic, and one quarter of total global disease burden can be attributed to environmental hazards. Under the umbrella of the One Health concept veterinarians perform public health tasks. [8] Introducing the One Health concept both in practice and education encounters many difficulties, however, general and individual factors that enhance its articulation can be identified. [9] [14]

Public health is an integral part of national security. One of its branches, military veterinary medicine [21] [24] is expressed as active veterinary services, both regular and reserve components, within armed forces. The military veterinarian can serve as an interface between civilians or civil organizations and the army. [24]

Veterinary profession, especially veterinary education must react to the recent challenges and should foresight future trends and possibilities. To take this step forward, the core paradigm – i.e. focus on individual animal medicine – of veterinary education must be changed. While preserving animal medicine, new priorities such as public health, environmental issues, and ecosystem should be established [38] preferably within collaborative programs [37] [38] that resembles the real work environment of a veterinary corps officer. Although "One Health" courses and graduate programs were launched, less is available for veterinarians entering into military service; [4] however there are encouraging examples such as the First Year Graduate Veterinary Education Program in the U.S. [49]

"One Health" has been used in a wide variety of contexts and thus has been judged to be a "buzz word"; [9] however, it is a weighty concept. In the army, "One Health" principles were already applied for a long time when the term One Health appeared. A good example for the above is a military veterinarian deployed in a military area where the next colleague holding a medical degree is stationed hundreds or thousands of kilometers away. Although "One Health" literature is overabundant, that of military "One Health", which was the cradle of the concept, is scarce. According to the author's views, military "One Health" should be scientific awareness both for acknowledging its key role and for making the "One Health" concept regain its significance. Most options are in the hands of veterinary medical schools as places of graduate and postgraduate veterinary education. Emphasizing the military aspects of "One Health" not only reveals an obscure corner but might help to regain the proper importance of "One Health" concept.

Notes

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Glossary

Arthropod: an invertebrate animal that has an external skeleton, segmented body, and segmented legs.

Food acceptance: food-related behavior based on phenomenological responses that result in the acceptation or rejection of food.

Food chain: all steps of food production, from the primary producer to the customer (“from farm to fork”).

Food inspection: examination of foods, food products or systems for the control of foods, including raw materials, processing, and distribution.

Food safety: the assurance that food will not cause harm to the consumer and covers contamination by chemical and biological agents and concerns about inherent food nature.

Food security: physical and economic access to food that meets both dietary needs and preferences.

Lyme borreliosis: a bacterial disease transmitted to humans, dogs, horses etc. by ticks (alternative name: Lyme disease).

Zoonosis: a disease or infection of animals that can be naturally transmitted from animals to humans.

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Table 1. General and individual factors that enhance the articulation of One Health principles. [9] [12] [14] [15] [16]

General factors	Unified vocabularies Mandated reporting of complex One Health stressors Accessible laboratory capabilities Disease reporting Best management practices in animal health care Surveillance in underserved communities Real-time processing of large diagnostic and syndromic data Assessments including regional characteristics, economic costs of defense preparedness Inter-professional trainings Interdisciplinary teams Increasing public recognition of the initiative [14] The 5 C's: consensus, collaboration, cooperation, coordination, commitment [15] Cross-agency collaboration Common external threat International/federal funding Nontraditional staff secondments Sense of urgency and common purpose Delegated authority or mandated work Interagency steering committee or working group Building trust Willingness to acknowledge the other agencies' concerns Science-based outcomes Legislative backing Information sharing Clear definition of roles and responsibilities Compatible data systems Building capable teams Facing and coping with difficulties or conflicts Commitment to outcome Accountability Identification of common mission and goals Attention to results [16] Sentinel species/animals Public health centers where collaboration can occur Community based projects [12] Administrative backing Less organizational and structural barriers [9]

Individual factors	Commitment and willingness to collaborate Ability to think beyond the boundaries of one's agency or organization Ability to represent a broad array of interests Decision-making authority or influence within one's agency or organization Experience in leadership roles and collaborative processes Science or knowledge capacity, or active engagement in One Health activities [16]

Table 2. Merwe [12] *identified the most important tasks and underlying characteristics of military health services.*

Task	**Underlying characteristics**
To operationalize the "One Health" concept	Being a natural link between private practitioners, governmental and non-governmental organizations, and the public
To assist intersectoral communication	Inherent collaborative health planning capabilities and its role in especially post-conflict reconstruction
To share its research capabilities and facilities	Interest in a healthy military population that is derived from the broader community
To assist in disease surveillance	Experience in areas of unknown health status, or where all infrastructure has collapsed
To play an active role in post-conflict reconstruction and development (restoration of health services and environmental degradation)	
To advice tertiary institutions as to curriculum needs to address "One Health"	Experience on the battle field

Table 3. The three main roles of military veterinarians. [24]

Role	**Means**
No 1. Support to conventionally-deployed forces	Caring for military working dogs and other military animals Support to the military medical system (in the area of zoonoses and on the safety of local food procurement) Training soldiers with respect to safe practices around indigenous animals
No 2. Support to civil authorities	Reinforcing provincial and federal veterinarians during an emergency under conditions where civilian veterinarians cannot Advising commanders during domestic operations that involve livestock Animal care and welfare (also important during evacuation of civilians from an area of operations)
No 3. Support to operations other than war	Working in disaster zones or in civilian conflict areas where the quality of life (including livestock health) is the root of unrest Being on the ground first, providing veterinary services during the stabilization period

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Wetland Ecosystems in Hungary's Nature Conservation Areas and Problems Relating to their Economic Utilization, from the Aspect of Nature Conservation

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If our current way of life is to be kept sustainable, particular attention must be paid to the management of the world around us – including our environmental conditions, natural resources and assets, and particularly the available water resources – and to the protection of natural elements that are, for whatever reason, of crucial importance for all of us. The aims and methods of the necessary protection are, however, not always compatible with farming activities and forms of land use that have been practiced, in some cases, for centuries. This article describes some of the incompatibilities and conflicts between various forms of farming and the relatively new domestic nature conservation activities, with a focus on Hungary's nature conservation areas and particularly its wetland ecosystems. This is followed by a discussion of problems associated with such conflicts and proposals for resolving them.

Keywords: *nature conservation, wetland ecosystems under protection, problems relating to modes of management*

Introduction

The management of groundwater and surface water resources has come to involve much more than distributing water among those using it for economic purposes: it comprises activities aimed at maintaining the circulation of water taking into account the relative proportions of the various elements of the circulation of water, the satisfaction of ecological requirements that are based on water resources, as well as river basin management, taking into account the widest possible range of natural and social interactions.

The second half of the 20th century saw a profound paradigm change in nature conservation. Rather than focusing on isolated areas, efforts came to be made to prevent damage to areas by altering the intensity of environment use over larger areas, not only by avoiding excessive but also insufficient cultivation, and by terminating or altering other activities causing anthropogenic damage. To this end, efforts are being made to harmonize nature conservation with the upkeep of biodiversity, the economic and social embeddedness of areas, the promotion of their development and bringing about changes in the existing segregational attitude. Based on this new approach nature conservation is opening up towards society, turning to

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scientists and other professionals for new methods, and offering new solutions for "users" of the environment (e.g. the necessary information and knowledge are being brought closer to people by way of offering education programs, creating educational trails and operating forest schools).

The Concept and Tasks of Nature Conservation and an Overview of the Relevant International Agreements

The Tasks and Objectives of Nature Conservation

Whatever is of value to us – however subjectively the term "value" may be interpreted – needs to be protected. Nature is valuable because we cannot live without it; it is something unique, without any alternative, and it is the basis of our survival. Natural values include animate (botanical, zoological) and inanimate (geological, hydrological, landscape) as well as culture-historical values along with their habitats and sites whose preservation and maintenance are important from scientific, cultural or economic aspects, along with species and things that are valuable on account of being rare or unique or threatened by transformation, destruction or extinction. [1] Water, soil and air are inseparably combined in a single whole in an ecosystem. Once man interferes in the natural processes or changes the composition of any one of these three factors, or upsets their natural processes, the ecosystem itself is bound to be damaged and transformed. [2]

Our natural resources are public property, therefore they must be protected. This is the basis of the principle of *nature preservation*. Nature preservation involves general protection of nature as a whole, the exploring, identification and preservation of our animate and inanimate resources, the maintenance and enabling of its processes, the preservation, protection, management and controlled presentation as well as utilization of the natural resources that are of importance from both scientific and cultural aspects. Some of these natural elements have "a mere" intangible value but others have actual economic value as resources for business, science or in the protection of human health or from an aesthetic or emotional perspective.

At the level of individual countries nature conservation is a centrally organized, regulated and controlled activity aimed at preserving, restoring, maintaining and – to the extent possible – presenting such values and systems.

The aim of nature conservation is to preserve and present the above mentioned values in a natural or as nearly natural state as possible, providing the conditions and requisites required for maintaining them, keeping up biodiversity [25] – that may also be viewed as the genetic resources of wildlife as evolved to date – partly in an indicator function (even if this is considered by some scientists as a gross interference with natural processes), enabling scientific research. Other important objectives include the promotion and popularization of nature conservation itself, bringing it closer to people, raising awareness of its crucial importance and its integration in the day-to-day life and functioning of society. The possible means to achieve these include making it possible for people to spend their spare time in a natural environment, as well as preserving, maintaining and presenting areas and facilities supporting traditional ways of life and farming methods.

The tasks of nature conservation may be grouped in a variety of categories, such as (a) official/state administration tasks comprising primarily regulatory functions ranging from

licensing, authorization and permission, supervision and sanctioning, along with (b) management tasks and (c) service provision functions.

Other concrete tasks include the identification, taking account of and listing natural values in need of protection (compiling Red Lists[2]), as well as the declaring of natural resources as resources under protection. To prevent conflicts of interest and provide for the most efficient and effective level of protection, values under protection in the framework of nature conservation need to be expropriated and brought under state management. Further concrete tasks include the exploring and identification of phenomena and factors threatening natural values under protection and the underlying causes, prevention of damage and once damage has occurred, the assessment of its extent and the preparation and implementation of recovery (recultivation, revitalization, reconstruction etc.), maintenance, management and development plans. Further tasks belonging to the scope of nature conservation include the development of areas designated for protection and areas already under protection, the development, construction and equipping of infrastructure for visitor centers and making arrangements for their protection (guarding). [3]

International Agreements, Treaties and Conventions Relating to Water and Wetland Habitats

The European Union's most important piece of legislation concerning water management and water resources is a regulation determining the Union's water policy, referred to as *Water Frame Directive* (WFD). [19] A series of rules and regulations were introduced in Europe from the 1970s on to improve the status of water bodies, however, those efforts failed to bring about the desired improvements. Policy makers therefore set about implementing a new water policy, one of the results of which was the adoption of the Water Frame Directive that entered into force on 22nd December, 2000. Pursuant to the rules laid down in the Directive Member States must improve their groundwater and surface water bodies so that they conform to the criteria of what the legislation refers to as a "good status" by 2015 – provided they can still be improved to that extent – and such good status must be rendered sustainable. Moreover, any further deterioration in the status of water bodies must be prevented. The WFD applies to all human activities that may have a significant negative impact on the status of waters thereby impeding the attainment and/or preserving of good water status. To make it easier for the Member States to comply with the WFD, Member States are allowed to set out less exacting environmental goals and/or longer time frames in cases where the desired water body status cannot be attained or it can only be attained in unreasonably expensive ways. (Such softer targets or longer time frames must, however, be properly justified.) Other objectives besides achieving good water body status include reducing the quantity of pollutants discharged into waters or terminating such discharges, along with the alleviation of the effects of floods and droughts.

The first task in Hungary in relation to the WFD was to work out a typology of waters on the basis of which the system of criteria required for the categorization of water quality can be elaborated. This will be the basis for identifying the various water bodies, establish their reference statuses, and ultimately for their evaluation and monitoring.

2 Red List, a collection of species threatened with extinction, the most comprehensive inventory of taxa under protection in the framework of nature conservation, compiled for the first time in 1948 by the former World Conservation Union, today known as International Union for Conservation of Nature and Natural Resources.

Natura 2000 is an ecological network established by the EU with the aim of contributing to the maintenance of biodiversity through the protection of habitat types as well as animal and plant species of Community importance, and to the maintenance of values already under protection in the framework of nature conservation and the possible recovery processes. The Natura 2000 network is based on the 1979 Birds Directive and the 1992 Habitats Directive. The Natura 2000 network covers some 17% of the total area of Europe. One of its key objectives is to protect bird species and special bird protection areas, which are, wetland habitats. The primary goals of the habitat protection directive include protection of biodiversity and ensuring the long-term survival of species and habitat types. The relevant areas in Hungary are listed in Decree 14/2010 Ministry for Environmental Protection and Water Management. [20] All of the areas that had already been under protection became parts of this network, as a result of which some 21% of the total area of Hungary is now covered by this new type of protection. As the Natura 2000 network is made up not only of nature conservation areas, the scheme involves farmlands and forests as well. Accordingly, the applicable regulation provides for the coordination of the various forms of economic utilization with the interests of nature conservation. [4]

The *Ramsar Convention*, [5] that is the "Convention on Wetlands of International Importance, especially as Waterfowl Habitat", is the oldest intergovernmental agreement on nature conservation, signed in response to the growing speed of the transformation and the destruction of wetland habitats. The Convention has been developing dynamically since its inception and the range of activities carried out within its scope has been growing wider and wider. The Convention has been signed by 168 countries to date and it cooperates with a variety of international organizations (BirdLife International, WWF,[3] IUCN[4]), enabling global action. Initially, the Convention was aimed at affording protection to dramatically decreasing waterfowl populations but in view of experience that accumulated over time emphasis was shifted from the protection of habitats to that of ecological systems. Hungary joined the Convention in 1979, and today there are 29 "Ramsar sites" in Hungary – of a total area of 204,000 hectares – including every one of the wetland habitat types that are characteristic of the Carpathian Basin. The topographical lot numbers of all of the areas qualifying as Ramsar sites in Hungary are announced in a ministerial decree by the Minister of Rural Development in office at the time of such announcement. At an international level Ramsar sites are categorized in 40 different wetland habitat types and/or combinations but in practice the following five large groups are distinguished: marine, river delta, lake, riparian and bog habitats. Man-made wetland habitats – such as fish ponds, crayfish ponds, agricultural ponds, salt ponds, water reservoirs, quarry ponds, sewage settling ponds and canals – are dealt with as a separate category. The most important objective of the Convention is to preserve wetland habitats and to sustainably utilize their resources in ways that do not interfere with their ecological nature. The signatory countries are required to fulfil basic obligations, the most important of which is to designate at least one wetland habitat to be added to the Ramsar List. At present the list contains nearly 2200 wetland habitats of a total area exceeding 208 million hectares. [5]

3 World Wide Fund for Nature
4 International Union for Conversation of Nature and Natural Resources

Nature Conservation in Hungary

According to the IUCN's definition a national park is an area whose ecological integrity must be preserved, an area that needs to be protected from any form of agricultural or industrial utilization, where educational and recreational activities must also be enabled to the extent possible, in addition to scientific research. It was in the United States of America that an area – the Yosemite Valley – was placed under state protection for the first time in the world but the first "real" national park was created by establishing the Yellowstone National Park in 1872. The first national parks in Europe were established in the early 20th century. The European Day of National Parks is celebrated every year on 24th May. In Hungary the Hortobágy National Park was established with effect from 1st January, 1973, by the No. 1850/1972 [21] and 1851/1972 resolutions of the National Nature Conservation Agency [22] (Hungarian acronym: Országos Természetvédelmi Hivatal – OTvH). Since then, the number of our national parks has increased to ten. The last one established so far is the Őrség National Park. Hungary's national parks are managed by Directorates whose operations are regulated by Government Decree 347/2006 (XII. 23.) on the designation of bodies performing tasks of authorities and administrative tasks relating to environmental protection, nature conservation, water management. [23] The areas covered by the competence of the various Directorates comprise not only national parks but also other landscape protection areas which are also managed by the Directorates. Hungary's national parks are summed up in brief in Table 1 below.

Table 1. National parks in Hungary. [6]

Name (year of foundation)	Area	Location	Other	Wetland ecosystems
Hortobágy National Park (1972)	80,549 ha, of which 1285 ha is strictly protected	Great Plain – Trans-Tiszania	The first and largest national park in Hungary. The largest salt area in Central Europe. An area of 75,000 hectares is part of the UNESCO World Heritage since 1999.	Hortobágy Fish Pond and Lake Tisza, a number of marshland areas Ramsar site 22,000 ha
Kiskunság National Park (1974)	56,761 ha, of which 12,457 ha is strictly protected	Great Plain – Duna-Tisza interfluve	Comprising 9 separate units, the whole area is a biosphere reserve	Lake Kolon, Tisza valley. Their wetland ecosystems and Ramsar sites

Name (year of foundation)	Area	Location	Other	Wetland ecosystems
Bükk National Park (1976)	43,130 ha, of which 3774 ha is strictly protected	North Hungary Mountains		Szalajka-valley and its region.
Aggtelek National Park (1985)	19,892 ha, of which 3922 ha is strictly protected	North Hungary Mountains	Part of the UNESCO World Heritage since 1995	Bodrogzug – a Ramsar site as well
Fertő-Hanság National Park (1991)	23,588 ha, 7492 ha of which is strictly protected	West Transdanubia – Small Plain		The whole area of Lake Fertő, Hanság
Duna-Dráva National Park (1996)	49,473 ha, of which 14,123 ha is strictly protected	South Transdanubia – along the rivers Danube and Dráva		Gemenc floodplain, Duna-Dráva riparian area
Balaton Uplands National Park (1997)	56,998 ha, of which 11,134 ha is strictly protected	Central and West Transdanubia, north of Lake Balaton and Lake Kis-Balaton		Balaton Uplands karst formations, Lake Balaton and the Kis-Balaton wetland habitat, canals
Duna-Ipoly National Park (1997)	60,314 ha, of which 16,119 ha is strictly protected	North of Budapest between the rivers Danube and Ipoly, Pilis and Börzsöny mountains, Danube Bend and the Szentendre Island	One of Hungary's national parks with the richest wildlife	Rivers, Lake Velence
Körös-Maros National Park (1997)	50,134 ha, of which 6411 ha is strictly protected	Great Plain – between the rivers Körös, Maros and Tisza		Rivers, flood plains, canals
Őrség National Park (2002)	43,933 ha	West Transdanubia – Vas county		Smaller rivers, lakes, fens/bogs

The Various Types of Wetland Ecosystems

Rivers' Active Floodplains, Protected Floodplains and Riverbank Strips

The territory of Hungary is very rich in rivers; however, about 95% of our rivers come from outside Hungary's borders. Owing to its climate and the topography of the neighboring countries, floods are a common occurrence in Hungary. Flood protection practices date back centuries, while the history of accessing and using rivers is as old as humanity. Accordingly, most of our larger watercourses are accompanied by active floodplains (the area exposed to floods even with the protective structures in place) and protected floodplains (the areas that would be flooded without protective structures in place). The whole of the territory of Hungary is part of the Danube basin. The database produced by the Ministry of Environment Protection in 2002 lists 10 rivers in the Danube valley and 18 in the Tisza valley with sections along which flood protection embankments have been constructed. The most extensive active flood plains are to be found along the rivers Tisza (45,882 ha; 36%) and Danube (36,764 ha; 29%), i.e. some 65% of the total active floodplain area is formed along these two rivers. The rest of Hungary's rivers are accompanied by active floodplains of significantly smaller areas, e.g. about 5% of the total active floodplain area is to be found along each of the rivers Hármas-Körös and Bodrog, while 4% of the same is located along the river Dráva. This however, does not mean that they have a less important ecological value. [7]

Riverside strips and active floodplains – partly as a result of the sediment deposited by the rivers and more or less frequent inundations year after year – have come to be temporary or permanent homes to special flora and fauna. Such areas show unique topographic and hydrological features, providing breeding, feeding, migrating and resting ground for wildlife. Protected and active floodplains are also important in that they play a key role in the material exchange processes along the rivers (between the body of water and the gravel bed). The zone along the river functions as a kind of a nutrient trap, this strip can reduce the load of contaminants coming from the river basin and this is where the process of the river's self-purification takes place through organic materials' decomposition and plants' nutrient uptake. [7] These areas are typically exposed to little human activity, therefore they often provide near-natural habitats for wildlife. This relatively pristine condition and the nearly permanent presence of water contribute to the appearance and development of a succession of biocoenoses. Active floodplains are therefore extremely valuable from an ecological aspect and for the purposes of nature conservation. Indeed, some of them are actually under nature conservation protection. Active floodplains are characterized by high degrees of biodiversity. The importance of active floodplains from the aspect of nature conservation has been growing steadily during recent years because wetland habitats of former open floodplains have been significantly reduced by the regulation of watercourses, as a consequence of which their roles have actually been taken over by the active floodplains, as areas in which similar wildlife can evolve. Active floodplains are home to practically all biocoenoses, ranging from forests, through meadows to peat and marshland type areas. Consequently, they are very important not only for nature conservation but also as areas used for agricultural production or forest farming. On the other hand, it should also be noted that the primary function of active floodplains is to provide for flood protection by safely channeling increased amounts of water down when rivers rise.

Hungary has an outstanding number of protected areas in active floodplains. In the territory of the Körös-Maros National Park nearly the entire floodplain of the river Maros – right from where it enters the territory of Hungary to where it flows into the river Tisza – is under some degree of protection. At the same time, it also has a section under cross-border – that is, international – protection, such as the area called Maros Naturpark at the town of Pécska, one of the most important parts of which is the Makó-Landor Forest. The active floodplain along the river Körös, that is also to be found in this area, is different from the aforementioned sites in that its current appearance is more of a result of human activities. The Tiszatelek-Tiszabercel Floodplain Nature Reserve was declared protected as early as in 1973. Through the integration of an area near Gávavencsellő its size was increased later on to 1263 hectares. The Tiszadob Floodplain area – also over 1000 hectares – was also among the first sites to be brought under protection.

Some rivers also have sections referred to as continental deltas. Such areas appear where rivers reach a plain area and break up into a varied and complicated system of branches, depositing their load and then after a while the branches reunite in the main river bed. [7] Such a continental delta is formed by the river Danube in Hungary in the regions called Szigetköz and Csallóköz, as well as at Gemenc, where it has built gravel layers up to 7 meters deep in some places. In addition to extremely widely varied habitats such a thick gravel bed in these continental deltas enhances the river's "self-purification" function and it also contributes to the cleaning of the water to be extracted from aquifers along the river.

Stagnant Waters, Bogs, Marshlands and Areas Covered by Reeds

Stagnant waters are water bodies with little or no natural discharge. Most of the waters belonging to this category are lakes and ponds. Their characteristics and status are determined by the purity and sediment load of the waters discharging into them. Depending on the degree to which it has filled up with sediment such a water body may be a lake, a morass, a marsh or a bog. Some have evolved naturally, others are man-made. [8] Such water bodies include, among others: Lake Héviz, the Tapolca Lake Cave, Lake Kis-Balaton in the Balaton Uplands National Park, Rétszilas Lakes in the territory of the Duna-Ipoly National Park, Lake Vaja and Lake Mohos of Kállósemjén in the Hortobágy National Park, Lake Baláta (which is also a Ramsar site) and Lakes Pacsmag in the Duna-Dráva National Park, Lake Szelíd in the Kiskunsági National Park. In the Aggtelek National Park – owing to the karstic surface – there are primarily dolines (sinkholes) and artificial lakes that are not under protection in themselves. In the Bükk National Park, despite its name, Lake Nyírjes is more of a bog; therefore it is listed in that category. The Hungarian part of the morass called Lake Fertő, taking up much of the area of the Fertő-Hanság National Park, has little open water surface, yet it needs to be listed here at this point.

Mention should also be made of what are referred to as "wetlands" since they can be regarded as clearly distinct water bodies. The Ramsar definition of a wetland is as follows "*areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.*" [5] This definition applies to fresh, brackish and salt waters, indeed, even coral reefs (since the Ramsar Convention was aimed primarily at identifying waterfowl habitats). [5] For this reason, for practical applica-

tion in Hungary wetlands are defined as natural units in which the average depth of water relative to the surface does not – at times of "medium" water level – exceed two meters. (Where the average water depth is over 2 meters, those parts of the given water body in which at least a third of the surface is covered or accompanied by macro-vegetation – pondweed, and/or marshland and/or specifically foreshore vegetation [standing – in part or in full – in water] qualify as wetlands.) [5] This category also comprises natural units with such hydromorphic soils whose top layer is saturated by water permanently or for much of the time and which are therefore characterized by vegetation typically comprising plants of high water requirements or those tolerating the presence of abundant water (reed beds, rich fens, marsh meadows, marsh plant communities, mud vegetation, sand/gravel bar vegetation, vegetations of wet alkaline areas and those of dry salty patches, moor forests and marsh woodlands, willow shrubs, soft and hardwood gallery woods, ash-alder woodlands), and/or their clearly recognizable residues. Wetlands appear in a wide variety of forms, not only in along and near rivers, lakes and seas but also at greater distances, in areas identified as subsiding depressions. In terms of their positions in the landscape, the following four categories of such areas are distinguished:

- bogs,
- marshlands,
- protected/active floodplains,
- the associated wetland habitats.

Bogs are permanent shallow stagnant endorheic water bodies (without discharge), dominated by oxygen scarcity or anaerobic conditions. Such areas are characterized by the build-up of peat because dead parts of plants can only decompose through rotting. The decomposition of organic materials entails the production of reduced compounds (e.g. methane, Sulphur-hydrogen, in some cases phosphine. [9] Bogs are an indication of an advanced stage in the process whereby stagnant waters fill up with sediments, in which higher order aquatic plants have occupied a large part of the surface. Bogs and fens appear in a variety of different forms (e.g. spring bogs, rich fens, raised bogs, floating bogs). A nationwide survey carried out in 2000 by the Ministry of Environmental Protection registered nearly as many as 1000 bogs and fens in the areas of nine national park directorates (including those registered earlier). The most extensive bog and fen areas are to be found in the Transdanubia Region, near and south of Lake Balaton, on the western edge of the sand ridge between the rivers Danube and Tisza as well as in the Nyírség region. Bogs and fens show a heterogeneous distribution in Hungary. Unfortunately, more than a third of them are already in the form of moor forests and mire shrubs, which is a sign of an advanced age. Moreover, the increasingly frequent drought occurrences have been causing quality degradation as well, as a consequence of which signs of a decrease in their effectiveness in their filtering function have been appearing. [10]

Rich fens are supplied with water from groundwater and precipitation. In its final status in the process of filling up with sediments a rich fen may turn into a forest bog. One typical representative of this type is the one near the town of Dabas that is home to the Dabasi-Halász Arboretum, or the bog at the town of Ócsa with the Selyem-rét nature trail. In areas with a cooler climate peat-moss bogs (raised bogs) may build up, where more organic material is produced than is decomposed. Such bogs are also characterized by an accumulation of peat. This type is represented by Lake Nyírjes at the village of Sirok as well, but its most important example in Hungary is the fen meadow near the village of Szőce in the Őrség National Park.

Floating bogs can evolve in shallow lakes, meanders and oxbows, slowly flowing side-branches of rivers through a process whereby the reedbed spreading towards the water creates a complicated mesh, which – with the settling dust, pieces of vegetation and the like – comes to form a mat floating on the water after a while. This mat grows thicker over time and it is acidified by precipitation, turning into a habitat for rare and valuable species of narrow tolerance ranges. Such floating bogs are to be found on Lake Velence and the Ráckeve Danube branch. Floating bogs are crucially important since they can absorb and retain a large amount of pollutants and contaminants, as large amounts of water flow across and get filtered by the floating bog mats. Their very highly intensive metabolic processes render such floating bog mats suitable even for the treatment of certain types of wastewater. [7]

Marshes are distinguished from bogs by the flow/exchange of water and the absence of peat accumulation. A marsh is characterized by a typically unstable balance of water, sometimes going dry, or it may be a shallow stagnant body of water that is regularly flushed through, densely populated by higher order plants with open water surfaces of various sizes in between. The bottom of a marsh accumulates organic sediments going through what is a partly anaerobic decomposition process, producing reduced compounds (marsh gas: carbon-dioxide, methane, and hydrogen-sulphide). Marshes are significantly more sensitive than bogs and are easily destroyed by water pollution. Hungary's most important protected marsh is called Vörös-mocsár (Red Marsh) near the village of Császártöltés in the Kiskunság National Park. Lake Kolon is also located nearby, the most extensive marshland area in the Danube-Tisza Interfluve region. [11] Lake Kék near the town of Szeghalom in the area of the Körös-Maros National Park is, despite its name, in fact a marsh and after nearly 20 years of local protection it was brought under national protection in 2006.

Oxbows

Thanks to their favorable characteristics and conditions oxbows enable a variety of different landscape uses, therefore in addition to their importance from the aspect of nature conservation and landscape ecology they also play a key role in water management and recreation. From the perspective of water management oxbows perform an important role as flood reserves, drinking water basis reserves and surface water recipients. Areas to be found within active floodplains also contribute to channeling floodwaters downstream. The total amount of water stored in oxbows in Hungary is about 119.4 million m^3, 87.2 million m^3 of which is stored in oxbows in protected floodplains and 32.2 million m^3 is stored in oxbows in active floodplains. [12] Besides recreation and tourism, oxbows have recently been coming to be used for a variety of commercial purposes (fishing, waterfowl production, reed harvesting). Active floodplain and former floodplain areas along oxbows are highly productive areas also utilized by forestry and agriculture. The various forms of utilization and use are, however, causing a variety of problems for landscape protection and landscape use. As a consequence of the various forms of use and the resulting organic matter loads the processes of the silting up, ageing and contamination/pollution of oxbows have been accelerating. [12] Owing to eutrophication[5] and drying out they are listed among heavily endangered water bodies.

5 Water blooming. Eutrophication entails an accumulation of nutrients, leading to primary productive organisms, including phytoplankton, pondweeds anchored by roots along with marshland plant species. [26]

There are many oxbows in the territory of Hungary as a result of the natural shifts of riverbeds and the regulation of watercourses. Besides the term oxbow they are also referred to in Hungarian in terms translating into English as dead river beds, lakes etc. Some smaller river branches may turn into oxbows temporarily when at times of low water levels one end is or both ends get temporarily blocked. Oxbows are of importance primarily for direct use of water – such as irrigation – in areas along the former river banks, but they are also useful in storing water drained from waterlogged areas or as recipients of other water discharges. Direct use of the water surface (swimming, and other forms of recreational use) is also important and such forms of use also entail contamination. They are also highly important in temporarily storing and channeling off surplus water during floods. On the other hand, as they have been created by the large amount of sediments carried and deposited by rivers, water filtered through the layers of sediments may also be relied on as a reserve drinking water resource. Reedbeds along the shore also play an important filtering role in the case of older oxbows.

Hungary's most important protected oxbows: [13]

The oxbow called "*Verőce-szigeti Holt-Duna*" was created on the right side of the river Danube, in the upper end of Szentendre Island as a result of the watercourse regulation works carried out in 1952. The oxbow is 1.6 km in length, its average width is 100 meters, its total area is 16 hectares, its average depth is 1.5 m and its volume of water is 240,000 m^3. It has been under nature conservation protection since 1968. It has been significantly filled up and a coppice forest is now flourishing around it. It plays an important landscape forming role and it is also important from the aspect of nature conservation. A significant number of drinking water wells are also located near the oxbow, therefore no form or type of utilization is permitted in this area in order to protect the wells.

The lake called "*Morotva-tó*" near the village of Lipót in the Fertő-Hanság National Park is one of Hungary's strictly protected oxbows. It is heavily filled up with mud; its water level is regularly monitored and when necessary, it is topped up with water from the Danube. Since there is a thermal spa nearby, sport fishing in the lake and reed harvesting on its shores are permitted under certain restrictions.

There are a number of protected oxbows in the territory of the Duna-Dráva National Park, including those called "*Böki holtág*", "*Belső-Béda* and *Külső-Béda holtág*", "*Nyéki Holt-Duna*", "*Csertai Holt-Duna*", "*Kadia Ó-Duna*", "*Klágya Holt-Duna*", "*Kishobogyi-tó*" (making up, with a number of other lakes, the oxbow system called "*Cún-Szaporcai holtágrendszer*"). Some of these have been isolated from the river through natural processes; others were produced by watercourse regulation works. Most of them have been heavily filled up with mud and are overgrown with vegetation, but none of these affect the drinking water aquifers, therefore they can be utilized for a variety of purposes. Based on permits issued by the water management authorities concerned they are used for storing water drained from waterlogged areas, and for sport fishing. They also play a significant role in landscape forming and nature conservation. The quality of the water in these lakes deteriorates heavily during dry spells. This is accompanied by drops in the levels of dissolved oxygen, decimating their fish populations. The rehabilitation of these lakes got underway in the 1990s after being brought under protection and their water retention is now controlled by weirs and locks.

Canals and the Land along their Banks

Canals are artificial structures, constructed for purposes of hydraulic engineering and/or water regulation, including the drainage of waterlogged areas, supply of water for irrigation or for industrial purposes, controlling water levels in other water bodies, or, less frequently, for wastewater removal or enabling inland navigation. They play an indirect role in the maintenance of the quality of water since their purposes include – among others – the removal of water that could have an adverse impact on water aquifers or other water resources. Canals that are sometimes referred to as "cut-through", connect rivers or river sections. The importance of canals lies primarily in the vegetation thriving alongside their banks. The original flora and fauna managed to survive in some places along canals constructed in order to drain marshlands or bogs. Although there are protected canals as well in Hungary, in most cases rather than a complete canal it is only a short section or the area alongside a canal that is under protection. In some cases the canal concerned marks the boundary of a given nature conservation area. Nádor canal in the area of the Balaton Uplands National Park, for instance, comprises a number of such areas. Its 37–88 river km section is home to the "Sárvíz-völgye" Landscape Protection District and the "Rétszilasi-tavak" Nature Conservation Area. There are strictly protected Ramsar sites along both sides of the Dinnyés-Kajtor Canal that removes the surplus water from Lake Velence. [14] One part of the boundaries of the nature conservation area south of Lake Tisza is also marked by a canal (Canal V or Aranyosi). Zádor-bridge and its neighborhood in the area of the Hortobágy National Park is crossed by numerous canals that are not under protection in themselves but are the habitats and nesting places of a variety of protected water fowls and other birds, including the great white egret *(Egretta alba)*, the grey heron *(Ardea cinerea)* and the collared pratincole *(Glareola pratincola)* among others, while in years of more abundant precipitation the canal called Karcagi I is home to the European pond turtle *(Emys orbicularis)*.

Possibilities for Economic Utilization of Wetland Habitats and the Associated Problems in the Light of Nature Conservation

Wetland habitats are among the most effective and efficient ecosystems in the East-Central European region. Our ancestors used these areas as hayfields and pastures, they harvested reeds, willow sprouts and wood. Wetlands were also excellent for hunting and fishing. Nature conservationists argue that these areas were drained and converted into agricultural land exclusively in order to boost agricultural output, but in some areas water levels subsided as a consequence of water management interventions. This negative trend is still apparent even today, despite the availability of techniques supporting wetland habitats besides enabling their utilization for economic purposes in suitable ways.

Reedbed Management

Water Quality Improved by Reedbeds' Filtering Function

The reed zone – or littoral zone – is one of the most important vegetation zones in various wetland habitats, forming a transition between dry land and water, functioning as a buffer

zone protecting surface water resources from certain contaminants and pollutants, external stress and anthropogenic impacts in general, coming from the dry land. Its complex fauna and flora is a venue of complicated feeding processes where all sorts of material flows and exchanges take place, ranging from the production to the consumption and from the decomposition to the accumulation of organic matter. [15] With a view to the role played by reeds, legislation had already been adopted even before the introduction of the WFD, to regulate the surveying, assessment and rating of reed lands. Government Decree 120/1999. (VIII. 6.) [24] on tasks relating to the maintenance of water bodies and public water facilities prescribes that owners of water bodies and river or lake beds must provide for the rating of reed beds to be found in their areas on the basis of water quality protection and shore/bank protection considerations, for the categorization of the areas concerned on the basis of such rating, as well as for the repeated performance of such rating and categorization once every five years. In addition to their water filtering function, reeds also play a major role in shaping the landscape, as well as in nature conservation, as they are home to a wide range of wetland and aquatic biocoenoses including animals ranging from invertebrate to vertebrate species.

The largest single reed-covered area in Central Europe is to be found in and around Lake Fertő, taking up some 7000 hectares of land in the Fertő-Hanság National Park. Large areas covered by reeds are also to be found along the northern shoreline of Lake Balaton in the Balaton Uplands National Park, around Lake Kis-Balaton and Lake Velence and in the Hortobágy National Park, for example in the Kisköre water reservoir. The total area of reed lands under protection is some 12,500 hectares, accounting for 2 percent of the total area of land under protection in Hungary.

Complications Relating to Reed Harvesting

Reedbeds are aquatic communities in a certain stage of the natural process called succession,[6] therefore their survival requires human intervention. [16] Careful management contributes to the maintenance of heterogeneous mosaic-like reed-covered areas. Adequately planned intervention may ensure the maintenance of a heterogeneous pattern in a given reed-covered area, including wet and dry patches, resembling a natural status to support wildlife and water-borne organizations, along with areas of homogeneous reed populations where reeds can be harvested in line with economic interests.

Reed scything used to be a traditional branch of farming in watery areas in Hungary. In winters when the soil froze over, reeds used for thatching roofs and for putting up fences were broken off manually. The utilization of reed-covered areas, that is reed harvesting, is one of the least intensive forms of land use.[7] In terms of land use categories Hungary has about 40,000 hectares of reed lands [17] but together with reed-covered parts of uncultivated natural water bodies the total area of reed lands in Hungary is about twice as large. Since it is indispensable that efforts be made to decelerate the process of the ageing of reed populations and eutrophication of water bodies, reeds should be harvested wherever possible. In

6 An ecological process whereby biocoenoses go through a series of transformations in space and time. Its result is a decrease in the likelihood of the survival of the given biocoenoses, facilitating the transit into the next stage. The direction of the series of changes is determined, from pioneer plant communities towards a climax community through various steps. [27]

7 A form of land use based on existing conditions and resources, without the application of fertilizers, without sowing seeds etc. In the case of reeds this involves only the cutting of the latest growth.

addition to its environmental advantages, reed harvesting also yields economic benefits. The removal of ageing reeds – i.e. part of the biomass output – contributes to the creation of more heterogeneous reed communities that are more favorable habitats for a variety of species (even if homogeneous reed lands are more favorable for reed harvesting). Heterogeneous reed communities are broken by canals, inlets and clearings in which newly sprouting reeds can develop vigorously.

Cutting reeds is that particular method of reed treatment whereby the plant's upper part over the water surface – stalk and seeds/flower – is removed. [18] There are two distinct harvesting times: summer and winter. Winter harvest is more advantageous for both wildlife and the quality of reed that is to be used for various purposes, while cutting reeds in the summer makes the vegetation of a reed-covered area more widely varied. Winter harvest removes the reeds' already dead, dry parts, which is favorable for the plant itself since it removes dead foliage, slowing down the process of succession, enabling also the maintenance of the dominance of reeds in the area concerned. Cutting in the summer removes fresh green reed stalks, giving room for plant species that do not grow that tall, enabling the growth of vegetation of a more varied composition and contributing to the maintenance of open water surfaces as well.

Reed is harvested in Hungary with special machines, for the most part in winter. Nature conservationists tend to heavily criticize the use of such machines, since even the machines themselves pollute the environment and when harvesting is carried out when the ground is not frozen, the machines damage the plants, preventing their re-growth. Mechanized harvesting facilitates the development of homogeneous reed populations, whereas heterogeneous plant communities are more favorable for the purposes of nature conservation, therefore manual harvesting would be more favorable from this aspect. Another problem is that the harvesting of reeds of lower quality is not economically profitable but neglecting such reeds leads to further deterioration of its quality. Fortunately, lower quality reed is suitable for use in facilities generating energy from biomass. High quality reed is used for thatching roofs and for producing reed panels.

Delayed harvesting entails a variety of problems from the aspect of nature conservation: late harvest destroys the buds from which the next year's shoots should sprout out in the spring and this practice also threatens the young of animal species living in such habitats. When the reed is not harvested in time, it is often burned down instead, which can also cause severe damage. While reed farmers argue that reed may be harvested even until the appearance of several inch-long reed shoots, conservationists hold that from the aspect of animal species whose reproduction takes place early in the year (e.g. greylag goose *[Answer anser]*) harvesting should be stopped in the middle of February already. This would be particularly important partly in order to prevent the destruction of the actual habitats and nesting places as well as to avoid scaring animals and birds away even from adjacent areas by the disturbance in the area being harvested. For this reason, one basic principle laid down by nature conservationists is that no reed farming activities (harvesting or burning) should be carried out in areas of reed management after the 15th of February. [18]

In addition to the timing of reed harvesting problems are caused for nature conservation by its frequency, the sizes of the areas concerned and the techniques of reed management. Homogeneous reed areas that are favorable for economical reed harvests require one-year – but not more than two-year – harvest cycles, because such reeds do not need to go through a thorough selection process. Such short harvest cycles are, however, favorable only for

highly tolerant animal species, therefore they are objected to by nature conservation. The least expensive method for the rejuvenation of aged and fully heterogeneous reed communities is burning. One additional problem with burning is that neither the edges, nor smaller reed-covered patches of land are treated at the same time, i.e. such areas tend to be neglected. Moreover, the chemicals applied to control weeds and pathogens are also unwelcome from the aspect of nature conservation.

The most important factors for reed-covered areas include hydrological conditions, which however, are nearly always ignored in planning reed harvesting activities. Local water management authorities should be involved in the planning of the management of larger reed-covered areas (over 1 hectare or so), because they can provide information on the prevailing water supply possibilities in order to determine the required balance. Reed management practices, that provide for sustainability and that are aligned to environmental considerations as well, should be developed in order to preserve natural values, heterogeneity, and the diversity of species and the complexity of habitats.

Fish Management

The Importance of Fish Management

The history of fishing is as long as that of humankind. Selective fishing of a reasonable intensity could be compensated for in early times by the extremely vigorous reproduction potential of fish species. To provide food supplies and to improve living standards man tends to overuse the land on which he lives, often disregarding the effects of man-made changes on diversity and habitats. The same applies to wetland habitats. Pollution, and the increase in the nutrient contents of water bodies, together with waterbed regulation, are among the most severe human interventions as a consequence of which the productivity of certain types of water bodies may grow to extreme levels, having negative impacts on more sensitive fish species (in contrast to which less exacting species proliferate).

Until the middle of the 19th century more than two million hectares of land was – permanently or periodically – covered by water in Hungary. Water was removed from most of those areas by land drainage or watercourse regulation, eliminating much of the wildlife that is dependent on water bodies or wetland habitats, while several species (such as the pelican) disappeared altogether. Hungary's rivers are characterized by a relatively high level of heterogeneity in terms of species, in contrast to natural lakes that are more homogeneous in this regard. [18] The construction of artificial fish ponds could and can only partly balance this process by creating favorable conditions for certain endangered species. Many of the existing fish ponds were created in the place of natural lakes or marshlands or in areas of wet and dry grasslands, which facilitated their population with a wide variety of species. Man-made fish ponds are also important in that economic activities provide for the survival of the wetland habitats often concentrating far larger amounts of biomass than in natural water bodies, particularly because most of these fish farms comprise not one pond but entire systems of ponds, including extensive canal and/or embankment systems. Reeds and typha communities and marshland vegetation along the edges of ponds are of importance not only for biodiversity but they also contribute to filtering and thereby to improving the quality of the waters concerned. [18]

Fish Management and Nature Conservation

Fishing and fish management is an economic segment almost without any conflict between the interests of economic participants and nature conservation, since the creation and maintenance of a suitable habitat entails water quality protection, the maintenance and improvement of the status of wetland habitats, the creation of near-natural conditions and the prevention of the shrinking of biodiversity. Fish pond management and fishing enable the settlement and presence of certain natural values in fish ponds. Therefore, while the operation of fish ponds is a source of livelihood for some people, fish ponds also help conservationists in their efforts aimed at maintaining aquatic habitats, as the key principle is that fish are the most important and most advanced water-borne animals, playing a key regulatory role in the aquatic habitat. The maintenance of the diversity of species is also in the interest of both fish farmers and conservationists.

One of the negative features of fish farming results from fish production practices. Before the productive season pond owners can boost the natural productivity of their ponds with farmyard manure [16] or some diluted form of manure. In some intensive fish farming systems even chemical fertilizers are added in small (100–200 kg/ha) doses. Though the quality of water in fish ponds has been found by certain tests and measurements 1–2 months after the termination of the addition of manure or fertilizers to be better than the original quality of the water – owing to nutrient management processes (through intensive hydro-biological processes nearly 100% of the added nutrients is utilized) – conservationists still have reservations concerning such practices.

More serious conflicts are caused by the treatment of the reed patches along the edges of the ponds. Although reedbeds also protect fish spawning grounds, fish pond owners – based on considerations of economic efficiency – make efforts to reduce the areas covered by reed, endangering the habitats of birds nesting there. Both sides agree, however, that in combating eutrophication there is a need for removing some of the reed, even if not in the form of reed harvesting. Fish pond management also involves draining and refilling the ponds, which is another practice endangering bird nesting places. Once drained, the pond's bed is often treated with lime, partly to eliminate unwanted fish species – often referred to as "garbage fish"[8] – remaining after the harvesting of the fish being produced and partly in order to disinfect the pond bed and improve the productivity of the water. [16] This technique is hardly justifiable from the aspect of nature conservation because the water remaining in the pond after it is drained is also home to a large quantity of protected fish species *(Cobitidae)* besides garbage fish, while other animal species that are dependent on water also seek shelter in the water remaining in the pond, and the application of lime causes severe damage to such animals as well.

Another set of problems for nature conservation is associated with fish species introduced to waters in Hungary from abroad. Such species are regarded as biological "contaminants" of ecosystems and they threaten indigenous biocoenoses because they reduce their reproductive potential or cause genetic degradation and in some cases they simply compete with and defeat indigenous species. [18] Even conservationists do not, however, dispute the advantages of the introduction of certain carefully chosen species. The fish called grass carp (Cteno-

8 Inferior species of fish that are too sensitive and difficult to transport, containing too many fish bones, fish that are not very tasty or those that cause a lot of damage, i.e. fish of little or no economic value, e.g. crucian carp. [28]

pharyngodon idella) for instance, is not indigenous in Hungary but it feeds on vegetation (macrophytes and pondweed), thereby slowing down the eutrophication process. Another such example is the introduction of the eel (Anguilla anguilla) (which is, by the way, indigenous in Hungary), as eels feed on bentic[9] organisms whereby they have a positive impact just like grass carps. Its over-population however, may also cause problems as it starts competing for food with other fish species.

Floodplain Farming

The meaning of the term floodplain farming (management) has still not been fully clarified. This term is applied in this paper to landscape use in floodplains and the utilization of floodplains. Even the origins and the history of floodplain farming are unclear, since it means not only agricultural production on millions of hectares of arable land created by the regulation of watercourses. Natural processes in rivers enabled certain fish species to find spawning grounds in flooded areas, so floodplains were important fishing areas. Floodplain forests also played an important role in water management. They were also used grazing lands and were important sites of fruit breeding. [18] Accordingly, floodplains gave rise to a wide variety of farming systems. Since however, by the turn of the 18th–19th century watercourses in Hungary had undergone regulatory interventions to let floodwaters pass downstream as quickly as possible, riverbeds became shorter, their water was trapped between embankments, floodplains were reduced and traditional floodplain farming and management techniques disappeared. Today a variety of efforts are being made to restore floodplain farming practices. Activities the like of the traditional floodplain farming techniques that prevailed for centuries are being carried out at present only in the Gemenc region of the Danube-Dráva National Park, the reason for which is that the area that used to belong to the Archbishopric of Kalocsa did not join the association set up to eliminate floods therefore the village was not protected by embankments.

The National Agro-environment Protection Programme is aimed at determining in a variety of ways – based on the Vásárhelyi Plan – where and how floodplain farming could be reintroduced in Hungary. Nature conservationists have serious reservations about the reintroduction of floodplain farming because quite a number of floodplain areas have been designated as nature conservation areas of national significance or as sensitive natural areas, therefore any economic use of such areas requires extensive and thorough prior consultations in regard to economic, development and utilization considerations. [17] Indeed, owing to the heavily regulated rivers an entirely new type of landscape and system of values should be developed. Since land use is aligned to inundation, only cropping without the use of chemicals may be permitted not only in sensitive areas but in all such areas. Also, in the case of utilization as grazing land, excessive quantities of manure must be prevented from being washed into water bodies. Another fact that must not be disregarded is what proportion of the floodplains will be used for emergency water storage, as that will be incompatible with any farming activity and may even cause serious damage in protected areas. Accordingly, only such options may be feasible when it comes to floodplain farming that are worked out with a view to considerations of national security, flood protection, farming, nature conservation and regional employment, social and welfare.

9 Living on the bottom of the water body.

Conclusion

It is not only within the scope of nature conservation and particularly in the areas of wetland ecosystems that professional and commercial considerations, viewpoints and local interests – in the case of wetlands and floodplains: business vs. nature conservation considerations – are contrary to one another and stakeholders pursue different and in many cases conflicting objectives. Centuries of farming and other economic activities based on water resources and the experience built up in the meantime, along with the problems caused by watercourse regulation that are still being faced, as well as the relatively new efforts aimed at protecting natural values and results already achieved, show that there is a need for a much more thorough and much closer coordination and harmonization of different areas, and for a more detailed elaboration of different points of view. As a possible solution I suggest that although representatives of different sectors strive to have their own requirements met, a number of points should be identified, in which justified restrictive and protective measures need to be enforced in order to protect the most crucial interests for the purposes of nature conservation and water resource protection and ultimately our own sustainable existence. As for conflicts between farming and other forms of economic utilization as well as nature conservation, it should be noted that economic considerations may appear to be more profitable in the short run, intensive interventions may cause serious damage to wetland ecosystems which will lead to a need for even more costly interventions in a longer run. Although a number of farmers have already recognized that sustainable farming and development is not possible without the coordination of certain farming methods with the prevailing environmental elements, practical implementation is still causing a variety of conflicts.

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Unprecedented Migration Crisis Affecting Europe: Will Western or Russian Style De-radicalization save the European Way of Life? (Part 1)[1]

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There are five main chapters of the analysis. The first chapter outlines the unprecedented migration pressure on Europe including political, economic, demographic, social, etc. factors. The second chapter gives an account of both Western and Russian de-radicalization efforts, providing a broad understanding of what de-radicalization is. It starts from crisis zones in the Middle East, North Africa and Afghanistan, followed by Western handling of the migration process itself prior to migrant settlement in Europe. The third chapter provides a list of fundamental questions unasked and unanswered by the European political elites. The fourth chapter will analyze some scenarios depending on European policy changes. The fifth chapter will provide recommendations for European policy makers to handle the migration crisis and minimize the damage already done to the European way of life, where de-radicalization and reintegration play a key role.
Keywords: *migration crisis, culture, Europe, policy*

> "Hijra is a core part of jihad going back to the Prophet Muhammad that involves Islamic conquest through migration. The objective is to overwhelm non-Muslim territories with Muslim populations until they achieve domination through sheer numbers. No weapons necessary – until they gain enough control." [1]
> "Hijra is a comprehensive and direct political attempt to undermine the culture and values of the host country and replace them with Islam and shari'ah. It is an insidious migration seeking transformation of the culture, behaviors, customs, rules and laws of a host society to spread Islam and establish an Islamic state." [2]

Root Causes of the Unprecedented Migration Pressure Affecting Europe

The contemporary migration crisis is not limited to Europe: it is truly a global phenomenon. The world population is approximately 7.3 billion, where – depending on our calculations – roughly only 1.2 billion people live in developed countries. [3] The majority of the world population lives in relatively poor conditions.

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Even though there are promising trends concerning the shrinking percentage of world *poverty,* [4] the worsening global economic outlook makes it more difficult to sustain improvement: "For the first time ever, the number of people living in extreme poverty is set to fall to below 10% of the global population in 2015, the World Bank said […] The economic growth outlook is less impressive for emerging economies in the near future, which will create new challenges in the fight to end poverty and attend to the needs of the vulnerable, especially those living at the bottom 40 percent of their societies" [5] Avoiding misery and searching for a better life, mainly in economic terms, is the most common cause of mass migration.

Europe is affected by migration pressures mainly from the Middle East, North Africa, South and Central Asia. [6] (Annex 1–4) The rapid *population growth* in economically backward countries where hundreds of millions people have no real chances to break out of poverty, contributes significantly to the number of people that take the risks of migration. [7] Such conditions provide a *firm* and *inexhaustible* source of migration. Rapid population growth – that will definitely build up more social tensions and migration pressure – is expected in the vicinity of Europe. "More than half of the gains by 2050, will come from Africa, according to (a UN – the auth.) […] report." [8] "The continent will add 1.3 billion people over the next few decades, roughly equivalent to the current population of China. By 2050, 1 in 4 people on Earth will be African, and the report expects Africa to be the only region that will continue to grow after 2050." [9] Unfortunately the indigenous European population will shrink during the same period.

The migration pressure on Europe is *de facto* unlimited. Several scholars dealing with security policy, history and demography have come to such conclusion. Ferenc Kaiser from the National Public Service University (Budapest) is an example of one. He is a historian and a geographer who teaches subjects relevant to security and defense policy. Kaiser made it clear in his lecture organized to educate all personnel involved in handling in the migration crisis at the Hungarian Ministry of Defense in Budapest in late 2015, that there are fundamental problems related to the migration crisis affecting Europe being unasked and therefore unanswered. In his lecture, he drew a sobering picture of the demographic background of the sources of the migration crisis affecting Europe, rhetorically asking questions about the limits of the amount of migrants Europe can take. Even though his questions were rhetorical and unanswered, the demographic facts that he presented were grave and convincing.

Péter Tálas, the head of the Strategic Defense Research Institute (Budapest), who supported more or less unlimited migration flow to Europe "as a needed labor force", criticized Kaiser's lecture in a mild way suggesting that "he smilingly injected poison". The audience though, comprised of mostly professional army officers of the Hungarian Ministry of Defense, tended to agree with Kaiser's approach. It is worth mentioning that ministry personnel responsible for security – no matter whether they are members of ministry of defense or ministry of interior – *tend to agree with curbing security challenges that includes mass migration*.

Others deny that there is any correlation between uncontrolled, mass migration and security, emphasizing the need to avoid "securitization" of the migration crisis. If there are neither economic, nor cultural or security concerns when tackling the migration crisis we end up supporting an unlimited migration flow to Europe, that leads to disastrous consequences.

The migration crisis that has been hitting Europe hard [10] since 2015, is unprecedented in contemporary history. Several factors lead to a dramatically increased number of migrants

entering Europe. Besides the already mentioned population growth and poverty, we can find amongst the root causes of the migration crisis:

- *wars* in Syria, Libya, Iraq, and Afghanistan;
- *instability* and various forms of *oppression* in several countries in Africa, the Middle East, South and Central Asia;
- *organized crime, which* makes a flourishing business of trafficking in human beings;
- *lack of solidarity* in the Muslim world to adopt refugees;
- *lack of unity of policies and actions* on the European side, powerful and "helpful" *donors* like George Soros [11] funding and encouraging migration. "…there's Hungarian-born billionaire investor George Soros, whom Orbán criticized as being a dark hand behind the migrant influx. Soros replied that the prime minister's 'plan treats the protection of national borders as the objective and the refugees as an obstacle. Our plan treats the protection of refugees as the objective and national borders as the obstacle.' Of course, critics would warn that Soros' true objective has nothing to do with 'protection' of refugees." [12]

One might argue that the main cause of migration is *overpopulation*. [3] This might be true, however, multiple other factors need to coexist to create conditions when a dramatic build-up of migration can occur. For example if overpopulation is combined with prosperity of the economy and rising living standards, migration might not even start. However, this is not the main trend in the regions that are a major source of migration to Europe.

Western and Russian De-Radicalization Efforts in Countries that are Main Sources of Migration to Europe. Western Failure to Handle the Migration Process, Prior to Migrant Settlement in Europe

Western Export of Democracy through Military Interventions to Countries that are Sources of Migration to Europe

Failed Western interventionist policies generate enormous frustration in countries that are a major source of migration to Europe. "Certainly we all feel for the displaced people, especially the children, but let us not forget that this is a man-made crisis and it is a government-made crisis. The reason so many are fleeing places like Syria, Libya, Afghanistan, and Iraq is that US and European interventionist foreign policy has left these countries destabilized with no hopes of economic recovery. This mass migration from the Middle East and beyond is a direct result of the neocon foreign policy of regime change, invasion, and pushing 'democracy' at the barrel of a gun." [13]

As we will see, Western military interventions, human casualties, destruction, imposed governments, lost balances between religious fractions etc. provide countless arguments for those advocating radicalization. It also provides a fertile source of people on the recipient side who are vulnerable to extremist recruitment. Russia also resorted to military interventions both at home in Chechnya and in Syria. However since the Russian solution is the opposite of Western export of democracy – when installing a form of a locally embedded dictatorship – Russia appears to handle radicalization far more effectively than the West. That includes post war peace, when Russian style nation building takes place. This phase is the most convincing.

Several Western military interventions took place in the regions that are a major source of the migration pressure to Europe from Iraq, Libya, Syria and Afghanistan. Western export of democracy to topple dictatorships or governments harboring radical Islamist terrorist forces can be viewed as *de-radicalization* efforts in a broad, strategic sense. If we disagree with such a broad, strategic interpretation or level of de-radicalization or we simply omit it, some root causes of further conflicts arising including Islamist *radicalization* would be unaccounted for.

All Western military interventions and attempts of democracy export in the Middle East, North Africa and *Afghanistan* are very problematic at best. In Afghanistan, the Soviet military intervention ended disgracefully providing hints that Afghan society is difficult to conquer or to reform. 9/11 provided powerful arguments to somehow eradicate the terrorist safe havens in Afghanistan but not necessarily with invasion and military occupation of the country. Powerful intelligence and accurate airstrikes could have achieved much eradication, with fewer costs in terms of human lives on all sides. On the other hand, such eradication on its own is not necessarily effective since it also generates a resupply of terrorists based on revenge and sympathy of their families, tribes, fellow believers etc.

Having Western – mostly US "boots on the ground" – also raises questions since Western style "nation building" proves not to be effective in Afghanistan. Especially if warlords prevail, [14] bitter civil war rages endlessly, [15] drug production and trafficking remains high [16] and corruption is not really a "problem" but "the system itself". We also need to note, that most of the costs on the Western side were needed to sustain the military intervention and occupation, and a fragment of the expenses were devoted for "nation building": "…just because those U.S. troops in Afghanistan no longer have a combat mission doesn't mean they're a bargain: the CRS (Congressional Research Service – the auth.) report says the cost of keeping a single American soldier there this year is an eye-watering $3.9 million." [17] (Annex 7)

Such realities by themselves question Western policies to de-radicalize extremist forces in Afghanistan. It is understandable that the costs of military occupation are high and are more-less set given the realities of Afghanistan. It is also understandable that the West does not have a political will to devote far more resources for nation building in a poorly developed, war torn country. However, in this case the failure of de-radicalization, "democracy export" and "nation building" is embedded in Western policy.

It is relatively easy to enter Afghanistan with military force but it difficult to find a convincing exit strategy once some major threats are neutralized. We can talk about "expectation management" when communicating "achievements" to the public in the Western world, rather than "real achievements": neutralization of threats thus convincing tendencies of de-radicalization. We also need to note that the local Afghan society is well aware of the success or failure of Western style de-radicalization efforts. Certainly better than the Western public that lives far away in an entirely different culture and social conditions, making them vulnerable to manipulation. Once Western military occupation lasts too long with too many casualties, too much money of the taxpayers is spent on "Peace Support Operations", the Western public tends to become skeptical concerning the success of the de-radicalization effort, furthermore: towards the Western presence in Afghanistan, as a whole. Very similar logic of changes in public opinion applies to other countries as well, such as Iraq.

In *Iraq* waves of Western military interventions lead to the toppling and later the execution of Saddam Hussein. It lead to major costs in both human lives and civilian infrastructure. The military intervention directly leading to the toppling of Saddam Hussein was based on false

justifications: the Iraqi threat of weapons of mass destruction against the Western world and suggested connection with Al-Qaida. Weapons of mass destruction were found during years of systematic search [18] and proof emerged of the opposite of Al-Qaida links of the Saddam regime. The ultimate argument became the "export of democracy". "The Bush team ignored advice that even if Saddam Hussein had weapons of mass destruction, it was a bad idea to invade Iraq, and they completely overlooked the fact that Iran and elements in Saudi Arabia were then, and continue to be, the greater threats in that region. The "reverse domino" theory that invading Iraq would transform the region was a fantasy sold to a nation in shock over 9/11." [19]

Military occupation of Iraq lead to instability, civil war, bloodshed, "no body counts" and ultimately to a disgraceful withdrawal of Western forces and more importantly, to *radicalization* in Iraq: to the rise of ISIS, which is the ultimate terrorist organization of our time. *The rise of ISIS is the biggest and most obvious policy failure of contemporary Western military interventions, nation building and export of democracy.*

Unfortunately neither the Western world, nor the Iraqi government fights ISIS effectively [20] At best, this can be interpreted as unwillingness to put civilian populations at risk and environmental concerns: "The White House says it did not start targeting ISIS oil infrastructure until recently due to environmental and collateral damage concerns. The real reason American forces were finally ordered to start destroying fuel trucks was the fact that Russia embarrassed them into doing so. Frankly, the whole White House narrative is incomprehensible. Therefore the American government is complicit in whatever consequences accrue from ISIS being able to grow, expand, and extend its reach across the world, threatening our way of life. The lack of American air pressure on the ISIS oil transportation and production network was the equivalent of a no-fly zone for the ISIS money machine." [21]

There are several reasons why we can question the number and the effectiveness of the airstrikes of the US lead coalition [8] that are unable to destroy not only a limited amount of armed jihadists but even their main income source, the oil infrastructure that is not possible to hide at all. The main reason is that the US lead coalition exploits ISIS in a geopolitical game against opponents, such as the Assad regime or partners that need to become more dependent on US help, such as the Iraqi government. Other countries have other reasons not to hurt ISIS. For example, Turkey is deeply involved in smuggling ISIS oil [22] making big profit from it. Turkey – a NATO ally – is not only involved in smuggling oil from ISIS, but also weapons, explosives, and various goods etc. as well. (Annex 8–11)

Another reason why fighting ISIS is not effective enough is that the Western world "lack of appetite" to deploy adequate ground forces to gain and hold ground from ISIS. A reason why there is no political will to deploy ground troops is because that would definitely lead to a great number of unavoidable Western casualties as we have learned it in Iraq or Afghanistan. Such casualties would eventually undermine public support in the Western world to fight ISIS on the ground, or even fight them at all.

In *Syria* the West officially supports "moderate" opposition [23] against the Assad regime. This is a gravely mistaken policy at best. "The Europeans share a good deal of blame as well. France and the UK were enthusiastic supporters of the attack on Libya and they were early backers of the 'Assad must go' policy. Assad may not be a nice guy, but the forces that have been unleashed to overthrow him seem to be much worse and far more dangerous. No wonder people are so desperate to leave Syria." [14]

We would rather call such Western policies unrealistic, misleading, bizarre and ultimately harmful. *First:* "moderate" opposition is not moderate at all in Western terms. They could be considered "moderate" in Middle Eastern or North African terms at best. *Second:* "moderate opposition" is reduced to a minority [24] (Annex 12) that is not convincing if we talk about a future governing force. *Third:* even if they could come to power, there would be instability and ultimately they could not stand the pressure of ISIS, leading to further gains of the terrorist organizations in Syria.

When considering Western solutions in an attempt to end the war in Syria it would be a mistake to assume, that US general David Petraeus is a madman. A four star general who was praised for his role when commanding US troops in Iraq and Afghanistan, also a former head of the CIA cannot be a madman. His "solution" is a reflection of madness of US policy making rather than an individual, a talented leader. "… we see the disgraced General David Petraeus in the news […] offering his solution to the problem in Syria: make an alliance with al-Qaeda against ISIS! Petraeus was head of the CIA when the US launched its covert regime-change policy in Syria, and he was in charge of the 'surge' in Iraq that contributed to the creation of al-Qaeda and ISIS in Iraq and Syria. The idea that the US can salvage its disastrous Syria policy by making an alliance with al-Qaeda is horrific. Does anyone think the refugee problem in Syria will not be worse if either al-Qaeda or ISIS takes over the country?" [14]

Russian intervention, vehemently criticized by the Western world, is truly a "game changer", being on the side of the Assad regime, thereby on the side of Syrian Government Forces fighting ISIS and various forms of opposition, including truly terrorist organizations.

There are at least two very alarming tendencies in Syria from the de-radicalization point of view. Even though Europe lags behind Tunisia and Saudi Arabia as a source of foreign fighters in Syria, a significant amount of European fighters left their home countries for the purpose of fighting. They gain war experiences, most likely commit classic war crimes and associate with terrorist organizations when fighting the Assad regime. If they are not killed, once they come back many of them could easily become the most dangerous jihadist terrorists in Europe. We are talking about hundreds of people. [25] (Annex 6) If we add migration from war zones, such as Syria, Iraq, Afghanistan etc. then even if the migrant jihadist terrorist population matches precisely that in the war zones, we would end up with thousands of jihadist terrorists in Europe, when most of them are experienced in real war conditions. Their de-radicalization is of the utmost difficulty, if possible at all. These warriors will most probably sooner or later become leaders, as a minimum organizers of possible terrorist attacks in Europe.

Another very serious concern in Syria is the possibility of a Turkish–Russian war that would change Syria as a source of migration affecting Europe beyond recognition, severely increasing the flow of migrants. The Turkish downing of a Su–24M Russian bomber aircraft that allegedly violated Turkish airspace on 24th October, 2015 [26] provided a hint that the initialization of a NATO–Russia war could be in progress. [27] The Russians remained remarkably calm when they did not attempt to retaliate for the downing of the aircraft. The Russians decisively increased their air defense capabilities [28] and they accompanied their bombers with fighters that they had omitted since ISIS was not capable of lifting fighters at all and Turkish "backstabbing" was beyond Russian comprehension. [29]

Turkish incursions to Syria in Kurdish territories [30] [31] [32] and artillery fire at Syrian targets could provoke a Turkish–Russian war. Since Turkey is a member of NATO and Article 5 of the Washington Treaty could be applied when a member state of the Alliance is

at war, this is a very dangerous scenario. In this case Turkish incursion into Syrian territory comes first. Syrian Army loyalty to the Assad regime then engages the Turkish Army. Russia must make a decision whether to provide direct or indirect support to the Syrian Army. If direct Russian support is provided to the Syrian Army against the Turkish Armed Forces, entering a major war with Turkey could become inevitable. If Russian Armed Forces get into direct military confrontation with Turkey, then we are on a brink of a major war not only between Turkey and Russia, but also between NATO and Russia. Such a war between the Alliance and Russia is in nobody's interest because it would lead to enormous destruction and ultimately to an all-out nuclear war that would most likely be the end of humanity.

On the other hand if Russia fails to adequately support Syrian government forces against a Turkish intervention, the entire Russian military intervention in Syria could fail. It is unlikely that Russia would abandon her policy goals and let down the Syrian Army when government forces defend Syria. The question is whether the Turkish leadership is wise enough not to get into an all-out direct military confrontation with Russia in Syria.

We will later return to de-radicalization efforts in Syria when evaluating the Russian military intervention as a way for de-radicalization of terrorists.

In *Libya* the Western military intervention leading to the fall of Muammar Kaddafi was justified to the public by suggesting that the local population had to be protected against the dictator. With the absence of the dictatorship of Kaddafi there is no end of sectarian violence in sight. ISIS is gaining ground in Libya at a pace that new US military intervention is under consideration. [33]

If military intervention, including airstrikes and raids of ground troops would ultimately take place, no one can foresee the true risks and the benefits regarding de-radicalization. This is a truly vicious circle of violence – that is very difficult to break – when even the eradication of Islamist fighters with pinpoint accuracy could generate sympathy towards them and hate against the "infidel invaders". Iraq, Afghanistan and Syria are good examples of long lasting violence where no end and therefore no successful de-radicalization is in sight.

The question arises why *any* Western effort to install a somewhat "pro-Western" democracy in Muslim countries in the Middle East, North Africa, South and Central Asia is very problematic at best, and such de-radicalization efforts have a great chance to fail.

In the Western world, we have Christian (secular) societies in cultural terms, no matter what percentage of the population is actually religious, and what subdivisions exist within Christianity. More importantly Western societies have lived in secular states since the success of bourgeois revolutions, where the state and the church were divided. Their division took place because the Church defended the old social system which could not and did not want to provide political and economic rights to the bourgeoisie that would match their ever growing economic power. The rise of modern nation states created cohesion which is an important pre-requisite of Western type bourgeois democracies. In Western countries the most broadly accepted view is that people identify themselves as citizens of particular countries. "In the 'ideal nation-state', the entire population of the territory pledges allegiance to the national culture. Thus, the population can be considered homogeneous on the state level, even if there is diversity at lower levels of social and political organization." [34]

In Muslim societies, there is either no secular state at all, or a secular state might exist, but it must be reinforced by some sort of totalitarian rule, most likely by a form of dictatorship. Once the authoritarian rule (the dictatorship) falls, for any reasons, such as Western military interven-

tion etc., the country will most likely descend into chaos and bloodshed. It is a likely tendency because Muslim societies are fragmented along religious and tribal lines, rather than nation states that are attributes of Western societies. The fragmentation of Muslim dominated societies is based on variations of religious beliefs within Islam (such as Shiites and Sunnites etc.), not to mention fragmentation between different religions (such as Islam, Christianity, Buddhism etc.). Tribal bonds are also strong enough to become a firm basis of fragmentation in conflicts between groups faithful to more or less the same religion. When people identify themselves based on variations within Islam and their tribe, the "foundations" of instability within countries are there. This vulnerability or tendency for instability is *hidden* when a sort of an authoritarian rule is in place, since various forms of dictatorships create cohesion. However, instability becomes *obvious* when the authoritarian rule and thereby an essential pillar of cohesion fails. Iraq or Libya are good examples, the fall of Saddam Hussein or Muammar Kaddafi has resulted in continued violence with no end in sight. It could take several decades or more before instability, civil war and all forms of violence might somehow simmer down, and peace and prosperity could somehow be achieved.

At this point we come to a conclusion that most Western de-radicalization efforts attempting to create Western style democracies in Muslim societies through military interventions and other forms of democracy export are *bound to fail*. We also need to note that *contemporary dictatorships in the Muslim world are* unfortunately the *necessary lesser evil* in comparison to civil war, endless violence and instability. We can safely conclude that Western interventionism to Muslim societies brought far more harm than benefits from the de-radicalization point of view but also in a broader sense.

Western countries tend not to learn from their mistakes, repeating them again and again when it comes to military interventions. The reason of this is clearly not that the Western world has no bright analysts or politicians. It is because the West – especially the US – is engaged in geopolitical games with unstated and unacknowledged goals that substantially differ from, if not the opposite of, what they sell to the public.

Russian De-Radicalization Efforts in Syria – The Chechen Parallel

Russia follows different strategies that significantly differ from Western methods when de-radicalizing Muslim extremism. There are four quite visible main Russian methods of de-radicalization that can be observed in Chechnya and Syria:

- the destruction of extremists by a major war or mostly by Special Forces in peacetime;
- installation of a pro-Moscow dictatorship that can effectively deal with Muslim radicals;
- serious investments to provide the pro-Moscow dictatorship with a powerful army, and propping up local living standards and infrastructure;
- heavy involvement of Russian secret services with "shoot to kill" policies.

Destruction by war or physical extermination might sound cynical as a way of de-radicalization, but it is factually exists, as a method. Chechnya and Syria are good examples of both. Interestingly Russian de-radicalization efforts in Chechnya and Syria are interconnected, since Russia is fighting radicalism in both places. We will examine Russian de-radicalization efforts in Syria and Chechnya in parallel, since it highlights that the basic Russian concept is mostly the same in both cases.

Both in Chechnya and Syria, Russia started de-radicalization with a classic war. While in Chechnya Russian ground troops were widely deployed to secure the gains of massive air-

strikes, in Syria Russia has the "luxury" to rely on the Syrian Army. In Chechnya Russian war efforts lead to a huge number of uncounted casualties and massive destruction of infrastructure, [35] in Syria the Russian made destruction is not so visible since the infrastructure of the country has already been destroyed by years of civil war. In Chechnya the lengthy military conflict was concluded by successful rebuilding efforts and installation of a pro-Moscow regime. Warlords alien to Moscow were systematically liquidated and a pro-Moscow warlord, Ramzan Kadyrov was elected as the Head of the Chechen Republic.[4] Russian president Putin made sure to finance the most powerful "warlord" in Chechnya that is Kadyrov who has the strongest private army in Russia. [36]

We use the expression "warlord" because it fits the power structure of Chechen society and it is key for pacification and de-radicalization of Chechen extremists. We can find amongst the de-radicalization methods of Kadyrov a simple and credible one: his men are personally entrusted with successfully tracking down wanted radicals.

Kadyrov knows that no insurgency can sustain itself without some level of support from family members or relatives. As a de-radicalization effort, Kadyrov calls on family members to either dissuade radicals from joining the insurgency or to turn them in to the authorities. "This appeal revealed a relatively soft stance compared with Kadyrov's earlier calls to have relatives deported or their houses destroyed for failing to turn in their loved ones." [37]

In Syria, Russia is clearly restoring the power of the Assad regime, even if Moscow officially says that the future of Assad will be decided by the Syrian people. Russia defends her geopolitical interests in Syria and in the region, just like in Chechnya, which is oil-rich. Unrealistic dreams about Western style democracy are clearly not a goal of Moscow, and not even under consideration.

In Syria, Russia has all the conditions to restore the power of the Assad regime. Rebuilding of the country will follow. We can expect similar results of de-radicalization in Syria we witness in Chechnya, where radicalism is under control of a dictatorship. Such Russian efforts are most likely to bring peace and stability to Syria. Most radicals and terrorists will either be killed or expelled from the country. A permanent manhunt will be sustained to track down and eliminate radicals. Secret services will be heavily involved.

We might agree or disagree with the Russian concept of de-radicalization, but it works. Unlike the Western attempts to export democracy to the Middle East, North Africa, and Afghanistan. The already visible Russian success of de-radicalization in Chechnya and the expected success in Syria are good news for Europe regarding the threats of radicalism and terrorism, in connection with the most probable reduction of the migration flow. Though Russia by itself will not save Europe but she will most likely contribute to European security.

Once Russia stabilizes Syria under the rule of the Assad regime, possible extension of Russian de-radicalization efforts could follow in Iraq or in Libya. Whoever would govern those countries when accepting Russian help to eliminate insurgency, radicalism and terrorism, will accommodate Russian geopolitical interests. The Russian methods will most likely be similar to what we see in Syria: Russian air campaigns against the insurgents combined with local government forces advancing on the ground, harvesting the benefits of Russian airstrikes. If Russia succeeds in Iraq and Libya as well, that would make a huge difference concerning European security in a positive way.

4 Heads of Russian republics are not called "presidents" because that might "overshadow" president Putin's "power and glory".

Western Failure to Control the Flow of Migrants to Europe

There is a shocking lack of unity of policies and efforts in Europe when tackling the migration crisis. More than 1 million migrants entered Europe in 2015 alone: most of them illegally and in an uncontrolled way. Even though a "politically correct" approach would abstain from "securitizing" the migration crisis, suggesting that there is no connection between uncontrolled migration from the Muslim world, the rise of terrorism and organized crime. [38] To the contrary: with uncontrolled mass migration Europe imports all sorts of problems of the Muslim world [39] including terrorism, sectarian violence and organized crime, especially if integration and de-radicalization fail.

Once migration becomes a necessity because of wars, poverty, political prosecution etc. the best short-term solution would be to settle the migrants as close to their home countries as possible. Preferably this should be done in countries that have a very similar or same cultural environment to those that are the source of migration. Once peace, stability and prosperity is restored in the source countries of migration, the migrants – or at least the majority of migrants – should return to their home countries.

Hungary provides a positive example, how the migration crisis should be handled by Europe. In 2015, an unprecedented migration flow affected Hungary because of the geographical location of migration paths. (Annex 2–4) During peaks, more than 4 thousand migrants crossed Hungarian borders every day. Such uncontrolled and illegal migration, when masses of mostly economic migrants and the true refugees used the green border to enter Hungary, and the majority refused to cooperate with Hungarian authorities, prompting the Hungarian government to take action. A temporary barrier (fence) was built along the southern border of Hungary. The military became involved in handling the migration crisis by enforcing police efforts. The legal basis to allow the military to perform new duties was created. Such policies brought good results since the uncontrolled migration flow through Hungary ceased in late 2015, law and order were restored. Hungary significantly contributed to the defense of the Schengen system, and several European countries that previously criticized Hungarian policies when tackling the migration crisis later resorted to the same or similar methods.

An unnamed Hungarian MoD official called Hungarian efforts to tackle the migrant flow by building a temporary barrier (fence) "extremist". We have to see clearly that the purpose of the fence along the southern border of Hungary is not to prevent migrants from coming but to prevent illegal, uncontrolled migration. Whoever migrates through Hungary must cooperate with the Hungarian authorities. For such reasons *European policies allowing uncontrolled, illegal migration are "extremist" and Hungarian policies to restore law and order when tackling the migration crisis are clearly not.*

Fundamental Questions that are unanswered by European Political Elites

In Europe which is mostly part of Western civilization some fundamental questions about migration are not on the agenda at all, thereby there is no real debate and no policy solution in sight. Europe is politically divided and that results in lack of unity of action when handling the migration crisis.

Why Migration Crisis Affecting Europe Literally "Erupted" in 2015, rather than Gradually Building up?

The problem is that the root causes of the migration crisis affecting Europe have already been there for years, often for decades. Civil war has been raging in Syria for more than five years. [40] The war in Afghanistan is more than a decade old. War or warlike conditions in Iraq have existed for more than a decade. ISIS emerged more than a year ago. [41] Demographic trends resulting in rapid population growth in Africa and the Middle East have also been visible for decades. The fall of Kaddafi, who kept migration affecting his country and Europe under control, took place years ago. The organized criminal underworld has also been "in place" for decades, ready to smuggle huge masses of population if payed for it. Poverty and social inequalities in Africa and the Middle East have existed for centuries.

One might say that the revolution of transportation is also a major factor of the migration crisis affecting Europe. However, it does not bring us closer to answering the question why the migration crisis in our region erupted in 2015. On one hand, trafficking in human beings mostly takes place with outdated forms of transportation, with boats crossing the Mediterranean. Secondly, the revolution of transportation did not occur in 2015, but rather over decades.

This list of root causes of mass migration affecting Europe is far from being complete. Such a list leaves the fundamental question – why the migration crisis affecting Europe literally "erupted" in 2015, rather then gradually building up – completely unanswered.

The answer is quite simple: even though the root causes of mass migration to Europe have existed for decades or more, the migration wave is a phenomenon being *organized* by powerful players. In other words, it is "orchestrated" to massively "erupt" in 2015. *Major players are orchestrating the migration crisis*:

- The United States of America is encouraging European leaders to adopt masses of Muslim migrants as refugees. The US financed NGO-s that directly support migration to Europe. Behind the "politically correct" masque of the US there is an unstated (or vehemently denied) policy to weaken Europe, as an economic rival.
- US policies to encourage mass migration to Europe would not work without the help of European liberal politicians, the bureaucracy of the EU, and European nation states, that are unable and unwilling to adequately analyze the migration crisis and sense the gravity of its consequences. These people betray European civilization as a whole when serving selfish interests, aligning with US interests to weaken Europe.
- Several countries in the Muslim world, including Saudi Arabia, Turkey and ISIS – the terrorist organization – also support mass migration to Europe. We are witnessing a radical attempt to spread Islam, gain influence and ultimately take over Europe.
- The criminal underworld, that earns a lot of money when trafficking in human beings, also contributes to the organization of migration to Europe.

Europe is in a weakened position already when facing the migration crisis. The indigenous European population is aging and shrinking, giving up values that proved to be fundamental for survival, similarly to Rome before it failed. We are witnessing the rise of individualism, selfishness, and the breakup of traditional values, basic building blocks, structures, and tendencies of European society: such as Christianity, marriage between men and women, family, sufficient birth rates etc.

Traditional values and building blocks of European society are ignored in favor of unnatural and deviant tendencies, such as career building first and only then a family afterwards etc. LGBTQ[5] rights growing far above the individual level. A gender-free culture, including names, titles, jobs etc. is encouraged. Sexual freedom with no responsibilities is "trendy", and no consideration is devoted to the future of the "free" individual, the family (the relatives, in broader terms), or even a nation or a society as a whole.

How many Migrants can be settled in Europe?

A fundamental question is not asked by leading European politicians and is clearly not on their agenda: how many migrants can Europe adopt. It is also important to clarify the time frame since *the pace* of the adoption of a large population with a significantly different culture could make a big difference. Can we adopt a million refugees per year as happened in 2015? Tens or hundreds of millions in a few decades? If the answer would be less than a million per year, maybe a few tens of millions in a century all together, we could debate whether the majority of migrants could be integrated into European societies successfully in years or decades.

If the answer is that there is *no limit* to how many migrants Europe can take, or that Europe can take hundreds of millions of migrants, maybe in a few decades, that would definitely *change European culture and the way of life beyond recognition*. In other words, if the *Muslim* migrant population sooner or later becomes the new majority in some European cities, later in Europe as a whole that would literally be equal to the *death sentence of European culture and way of life* as we know it.

In arriving at such conclusions, several fundamental issues of "political correctness" should be analyzed. Probably the first that would come to our mind is the equality of religions. It might appear to be in contradiction to our emphasis on *Muslim* migrants and not migrants in general.

First, we need to note, that the main source of the migrant flow to Europe now comes from North Africa, the Middle East and Afghanistan. It means that the majority of migrants are Muslims. Therefore we are dealing with facts, when we associate migration to Europe with Muslims, and that is clearly not religious discrimination.

Second, we can agree that nobody as an individual or a religious group should be subject to differentiation, especially oppression because of their faith. However, there is a big difference in cultural terms when we talk about *indigenous*, *minority* or *new majority cultures*.

Indigenous religion and culture in Europe is Western type Christianity coupled with secularism since the church and the state were separated by bourgeois revolutions. *Minority* religions in Europe are those that are not Christian. If Muslim culture becomes a *new majority culture* in Europe, especially if the transformation to a new majority culture would occur in a historically unprecedentedly short time in Europe as a result of Muslim mass migration it would definitely be a *cultural shock*.

The percentage of Muslim population was around 6 percent in Europe in 2015. [42] (Annex 5) "Europe's Muslim population, boosted by large families and immigration, will nearly double, from less than 6% (43 million people) in 2010 to more than 10% (71 million people) in 2050, the forecast estimates." [42]

5 Lesbian, gay, bisexual, transgender, queer (questioning their identity).

It might appear to be an exaggeration to seriously consider a Muslim majority culture in Europe in the foreseeable future. However, scientific methods when calculating the percentage of the Muslim population include a great, dynamic "unknown": key issues of European policies when tackling the migration crisis. If European policies would allow entering an *unlimited* amount of migrants, with no upper limits, an ever growing number of people will surely come since the migration pressure is expected to grow. Europe could theoretically accommodate millions or tens of millions of Muslim migrants per year, most of them seeking to achieve better living standards. In combination with higher Muslim fertility rates [43] and the decline of indigenous European population, Muslims could indeed become a majority in Europe by 2050.

If Turkey is allowed to enter the EU, within decades it would result in another disastrous turn of events regarding European culture and way of life. Even if Turkey is still a secular state, 99 percent of her population are Muslims and the country is clearly turning back from secularism under the presidency of Erdogan.

Europe will also have to consider the worldwide trend, according to which *"Over the next four decades, Christians will remain the largest religious group, but Islam will grow faster than any major religion…"* [43] There are indeed far reaching consequences of such tendencies since we live in a globalized world.

Based on contemporary realities in Africa, the Middle East and Afghanistan *we cannot expect similar or the same political correctness from a newly established Muslim majority* in parts of Europe, especially if they become a majority *in Europe as a whole*. We need to remember that political correctness is an invention of the Western world that is not wildly accepted and practiced in Muslim dominated countries all around the World.

We also need to keep in mind that fundamental cultural changes as a result of massive migration in the 21th century could occur in a historically very short time, in a few decades if migration would go uncontrolled. Such a short time is clearly not enough to integrate a new Muslim majority: the opposite would occur. The new majority would "integrate" the indigenous Christian culture and there is no reason to expect that such an integration would be peaceful and based on democratic principles, since *there is no truly democratic Muslim country* (in Western terms) *in the world*. With Muslim mass migration we import all sorts of problems originally attributed to the countries providing the human source of migration.

Since we cannot expect similar or the same political correctness from a newly established Muslim majority in Europe, the integration of large Muslim populations becomes a one way street. If Europe might let them settle, they will surely transform Christian (secular) European culture to an average Muslim culture that could be a mixture of what we witness in the countries where the migrant populations come from.

(To be continued.)

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Annexes

Annex 1. Indian passengers stand and hang onto a train as it departs from a station on the outskirts of New Delhi.

Source: www.cnbc.com/2015/07/30/world-population-quarter-of-earth-will-be-african-in-2050.html (Downloaded: 04 02 2016)

Annex 2. Main global migration routes.

Sources: Missing migrants project, international organization for migration; UNHCR; I-map; regional mixed migration secretariat

http://news.nationalgeographic.com/2015/09/150919-data-points-refugees-migrants-maps-human-migrations-syria-world/ (Downloaded: 04 02 2016)

Annex 3. Eastern Mediterranean and East African main migration routes to Europe.

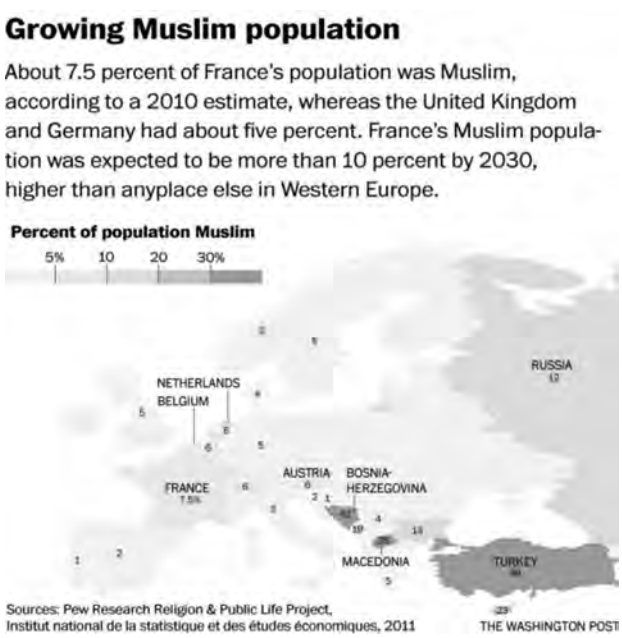
Sources: Missing migrants project, international organization for migration; UNHCR; I-map; regional mixed migration secretariat

http://news.nationalgeographic.com/2015/09/150919-data-points-refugees-migrants-maps-human-migrations-syria-world/ (Downloaded: 04 03 2016)

Annex 4. Main sea migration routes to Europe.

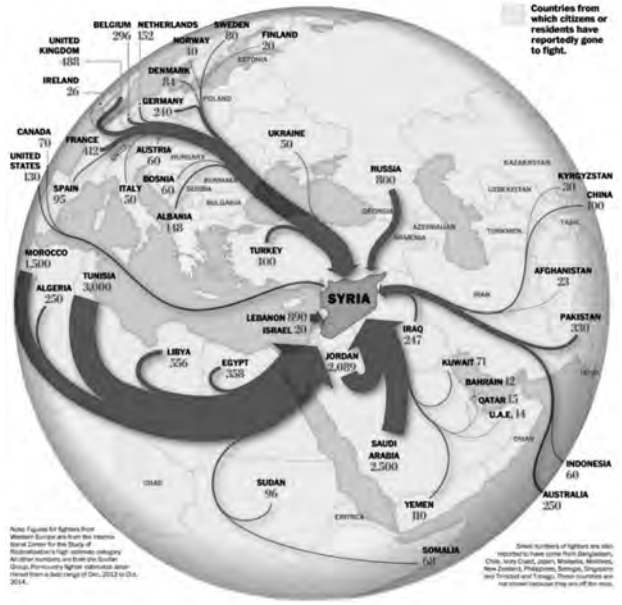
Sources: Missing migrants project, international organization for migration; UNHCR; I-map; regional mixed migration secretariat

http://news.nationalgeographic.com/2015/09/150919-data-points-refugees-migrants-maps-human-migrations-syria-world/ (Downloaded: 04 03 2016)



Annex 5. Growing Muslim population.

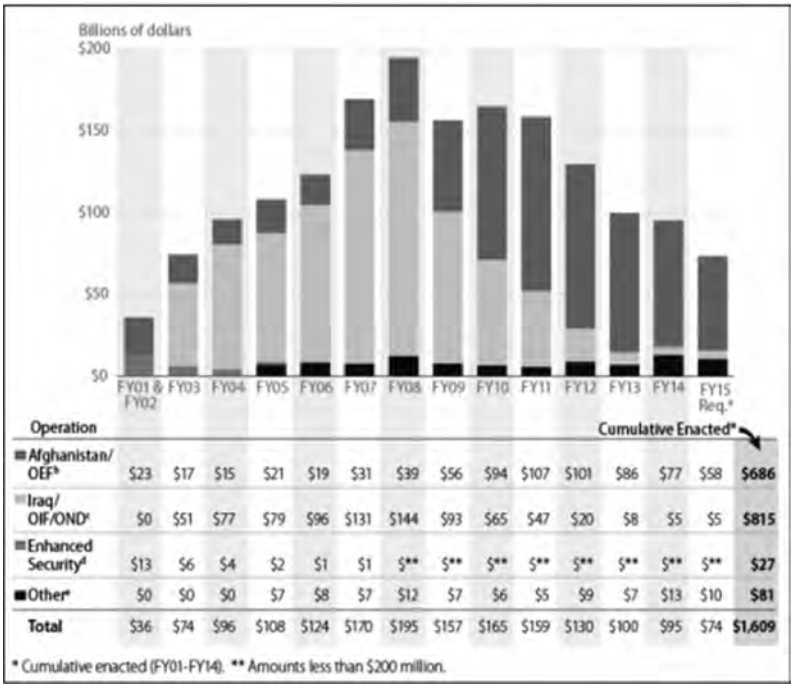
www.washingtonpost.com/news/worldviews/wp/2015/01/09/map-frances-growing-muslim-population/ (Downloaded: 04 03 2016)



Annex 6. Countries from which citizens or residents have reportedly gone to fight in Syria.

Source: The Washington Post.

www.washingtonpost.com/news/worldviews/wp/2015/01/09/map-frances-growing-muslim-population/ (Downloaded: 04 03 2016)



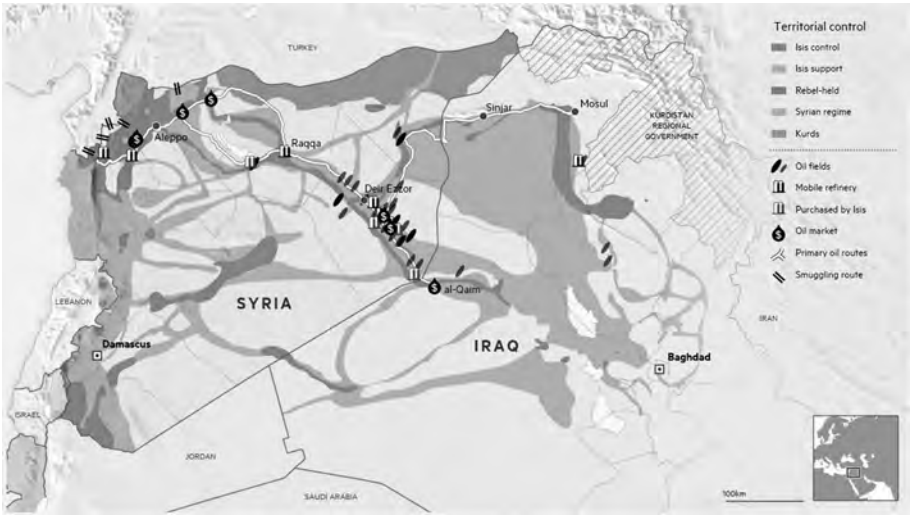
Operation	FY01 & FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15 Req.*	Cumulative Enacted*
Afghanistan/ OEF[b]	$23	$17	$15	$21	$19	$31	$39	$56	$94	$107	$101	$86	$77	$58	**$686**
Iraq/ OIF/OND[c]	$0	$51	$77	$79	$96	$131	$144	$93	$65	$47	$20	$8	$5	$5	**$815**
Enhanced Security[d]	$13	$6	$4	$2	$1	$1	$**	$**	$**	$**	$**	$**	$**	$**	**$27**
Other[e]	$0	$0	$0	$7	$8	$7	$12	$7	$6	$5	$9	$7	$13	$10	**$81**
Total	$36	$74	$96	$108	$124	$170	$195	$157	$165	$159	$130	$100	$95	$74	**$1.609**

* Cumulative enacted (FY01-FY14). ** Amounts less than $200 million.

Annex 7. Estimated War Funding by Operation, FY2001-FY2015 Request.

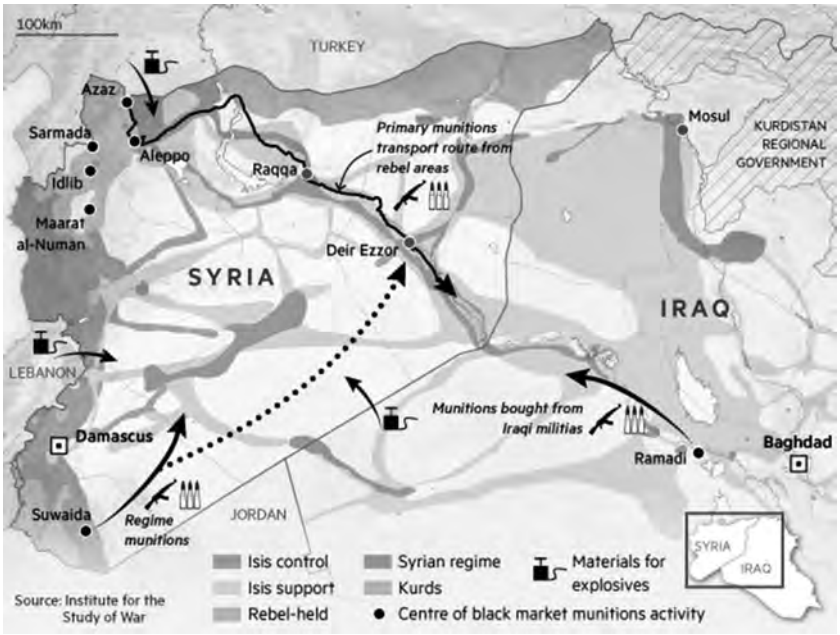
In Billions of Dollars of Budget Authory.

Source: Congressional Research Service via Federation of American Scientists. https://www.fas.org/sgp/crs/natsec/RL33110.pdf (Downloaded: 04 03 2016)



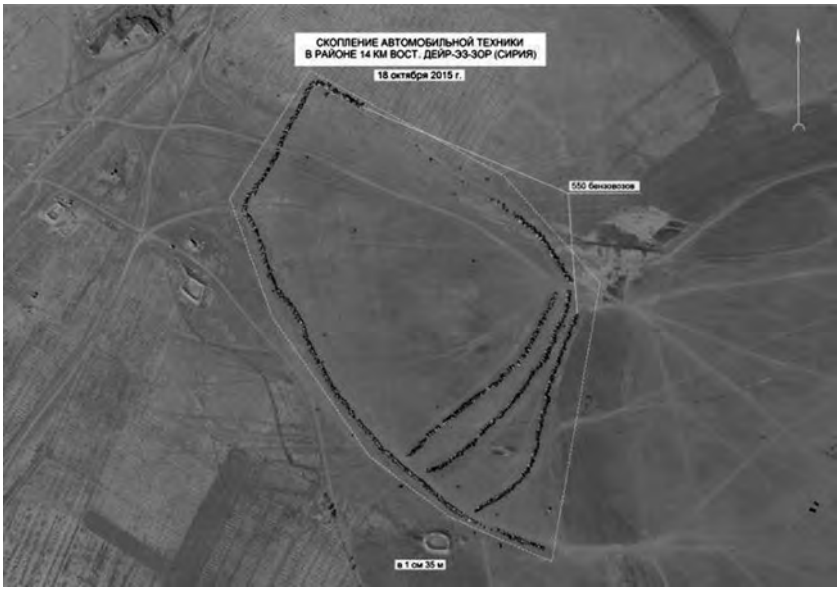
Annex 8. Inside ISIS Inc.: The Journey of a Barrel of Oil.

Source: The Financial Times. http://ig.ft.com/sites/2015/isis-oil/ (Downloaded: 04 03 2016)



Annex 9. ISIS: The munitions trail.

Source: The Financial Times. www.ft.com/intl/cms/s/2/baad34e4-973c-11e5-9228-87e603d47bdc.html#axzz3t9j7TuQn (Downloaded: 04 03 2016)



Annex 10. Approximately 550 gasoline transporter vehicles massed in Syria on 18 October 2015.

Source: Russian General Staff, Ria Novosti. http://ria.ru/syria_mission/20151202/1334390432.html (Downloaded: 04 03 2016)

Annex 11. More than 3000 fuel tankers amassed in Turkey according to a Russian satellite image of Sylopy (Turkey). They serve as an evidence of Turkish Oil smuggling in cooperation with ISIS.

Source: Satellite imagery of the Russian General Staff. http://ria.ru/syria_mission/20151202/1334390432.html (Downloaded: 04 03 2016)

Annex 12. The so called "moderate rebels" in Syria.

Source: www.almasdarnews.com/article/27951/ (Downloaded: 04 03 2016)

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Unprecedented Migration Crisis Affecting Europe: Will Western or Russian Style De-radicalization save the European Way of Life? (Part 2)

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Why Transformation of Europe to an Islamist State is literally a Death Sentence for the European Culture and Way of Life as a Whole?

Such a transformation – if allowed by Western "political correctness" and suicidal inability to preserve our culture and way of life – would necessarily result in forms of Muslim political and religious dictatorship truly unacceptable for the majority of the indigenous European population. It will change all major aspects of our way of life. The secular *Western style democracy will collapse, an Islamist state (or states) would take over*. Not only would the contemporary Christian (secular) culture be literally *destroyed* but the entire cultural heritage as well.

Christian churches which are truly a pillar of European cultural heritage would either be erased or transformed into mosques where portrayal of a human face would be prohibited. The museums which constitute another fundamental pillar of European culture would also be destroyed. According to an optimistic scenario most of their treasures would be sold around the world, some by chance would be left in Western museums in the US, Canada and Australia, who might be able to preserve a fraction of the artefacts. The majority of the artefacts of Europe would probably be destroyed as they constitute a part of an alien culture.

The logic is exactly the same as when the Taliban destroyed the 1700 year old Buddha sculptures in Afghanistan. [1] [2] [3] [4] [5] [6] [7] [8] [9] (Annex 1) ISIS systematically destroys all cultural heritage that contradict their interpretation of Islam. They destroyed countless buildings and artefacts in Iraq and Syria. [10] (Annex 2–5) When ISIS destroys buildings of cultural heritage they attempt literally to erase it as a deliberate act to make rebuilding from original stones impossible. As a part of this incredible sin against cultural heritage several buildings and artefacts of Christianity were destroyed by ISIS, including the 1400 year old St. Elijah's monastery in Mosul, Iraq. [11] [12] (Annex 3–4)

The destruction of cultural heritage is not limited to religiously obvious cases, such as the prohibition of the depiction of human faces. Ancient Roman and other archaeological sites are destroyed (Annex 5) as well with no obvious or credible explanation, except *the will to destroy everything that shows that ISIS does not represent the only culture on Earth. Such extremism is a new phenomenon since the cultural heritage ISIS destroys managed to survive centuries of wars.*

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We must see clearly that there is a huge difference between the vast majority of Muslim people who live in peace and the Islamist fundamentalists whose actions have been illustrated. Muslim parties gaining power in Europe will most likely support *unlimited* immigration of their Muslim brothers. Once tens of millions or hundreds of millions of Muslims enter Europe, Islamism will take over the formerly Christian (secular) continent. If Islam becomes a new majority religion and way of life in Europe, we can be sure that radical Islam will also gain space. Radicals would feel the necessity to *conquer* the "infidel" land making sure that there is no turning back. This will result in a systematic destruction of all forms of European culture, even if the majority Muslim population newly inhabiting Europe were to be peaceful and tolerant towards Christianity and secularism.

Barbaric modes of destruction of rival cultures based on religious ideology are not the monopoly of radical Islam. Similar incidents occurred even within Christianity, when the Reformation fought Catholicism, resulting in the destruction of religious figurative art. [13] (Annex 6) But at least the walls of the churches survived in most of the cases and a different form of Christianity was practiced in the same churches. We also need to see the big difference between destruction of religious cultural heritage centuries ago, and right now, in the 21th century. From this point of view, Christianity has "grown up". On the other hand, radical Islamism represented by ISIS attempts to drag us back to the darkest realities of the past.

Unfortunately, if such historical precedents of destruction of cultural heritage in the name of radical religious ideology are not convincing, or destruction does not occur at all – which is highly unlikely when considering a Muslim takeover of Europe – less radical tendencies would have the same or very similar results. If there is an Islamist takeover in Europe, no matter how "gentle" or "politically correct" it might be in our fantasies, it will establish a new cultural reality where indigenous Christian culture is a question of the past. In other words: *unpracticed and ultimately dead*.

Why it is Very Difficult to Integrate Large "Blocks" of Muslim Populations into European Culture?

While contemporary Christianity is an individualist religion, Islamism is truly communal. [14] Contemporary Christian religion in Europe is the private business of individuals. It is up to the individuals whether they are religious or not, or which religious faith they might believe in. Christianity expects not much more than that the faithful sometimes visit the appropriate church, keep some distinguished holidays, and maybe attend during ordinary weekends as well. The faithful need to avoid certain sins. Generally speaking, the faithful should share some prayers with other believers in a church and that is more-less all that the Christian churches expect from the faithful.

To the contrary of contemporary Christianity, the Muslim religion is not individualistic but truly communal. All individuals should obey teachings of the Quran, and there are many customs for daily life that must be followed. The individualist liberties that exist in Christian (secular) societies do not exist in a Muslim society.

If we compare the power of an individualistic or a communal religion, in this case Christianity and Islam, we can safely conclude that the communal religion has a bigger effect on masses, than the individualistic religion, since more practices and feelings are shared by definition. We can also conclude that a communalistic religion is less tolerant if some individuals

have a different faith, different customs to what the Quran prescribes. This lack of tolerance has far reaching consequences when a communalistic religion becomes a majority, even if it is just a local majority in a village.

"Atomized" individuals can more easily assimilate into a different cultural environment than entire communities, living in separate districts, villages, cities etc. It is far more difficult to assimilate entire communities "glued" together by a communalistic faith, especially when they live separately in big groups. If they live in poor districts, ghettoes, they would also become frustrated and desperate. To de-radicalize the extremists coming from ghettoes surrounded by their own culture is of utmost difficulty.

It is also difficult to de-radicalize the indigenous extremists in Europe, who are well aware of the unresolved issues of the migration crisis and frustrated by the realities according to which no successful assimilation of entire migrant communities is taking place.

Can an Islamist Transformation of Europe be reversed at an Early Stage?

Today, there is a significant but nevertheless still "manageable" immigrant Muslim population in Europe. It is difficult to assess the percentage of the Muslim population in Europe, though when they successfully establish their own political parties it will have a significant influence on European decision-making.

Once they become a significant part of the European political system, we would expect that any limitation of mostly Muslim immigration will become ever more difficult, since it would require greater unity on the side of the indigenous population, which – in spite of some promising tendencies – is not yet in sight. Thus, we end up with an example of *a Trojan horse on a strategic scale in Europe*. The difference is that according to the original story the soldiers had to hide inside the Trojan horse because their presence was a secret. In our case, the massive inflow of Muslim migrants to Europe happens openly, in front of everybody's eyes.

The European leaders and the indigenous masses must be well aware of political, economic, cultural etc. realities of the countries in the Middle East, North Africa and Afghanistan. If they deliberately want to ignore basic facts and tendencies because of indifference or in order to be falsely "politically correct", it would lead to disastrous consequences.

Once the gates of Europe are wide open because of the permissive policies of European leaders, the indifference and the dividedness of the indigenous population and the active "help" of pro-Muslim parties will be a critical point in European history when unwanted changes will speed up. At a certain stage, there will be no chance to stop the massive inflow of migrants, unless help comes from outside Europe.

Once a sort of an Islamic state is established in Europe, or in certain European countries, a fundamental question will arise, is there anything the Western world can do to reverse it? The answer is "yes", but the "solution" is an extremely "bitter pill". The solution would be a last resort in nature, namely: military intervention, resulting in a massive repatriation of Muslim populations from Europe, especially the economic migrants arriving to Europe since 2015, definitely not the true asylum seekers.

No matter how we evaluate such a "solution", we might agree on the following principles:

- There is a need to limit migration in order to preserve European cultural heritage and way of life.

- As long as Western Christian (secular) culture is a majority, we can expect "political correctness" as a rule of the game, however once Muslim culture becomes a dominant player in Europe, such rules should be considered obsolete.

Who Organized the Wave of Muslim Migrant Violence in Germany on New Year's Eve and Why? Who Attempted to Cover It Up and Why?

It caused a series of "headaches" to understand what happened in German cities on New Year's Eve, when massive sexual violence hit hundreds of German women, especially in Cologne. [15] We might accept, that there are *individuals*, who are "bad apples" in all societies around the world, who commit crimes, such as sexual harassment and even rape. Since the violent incidents took place in several German cities simultaneously, and a Muslim mob comprising 1 thousand young males (or more) committed sexual violence in Cologne, we can be confident when attributing such events to premeditated organization. It is far from evident who organized such a "bombshell" of violence and why, shaking up the German society as a whole.

The first idea that came to our mind was that the organizers could be Muslim leaders of mass migration. According to Muslim culture women are far from being equal: they are a sort of a "property" of men. Young, "infidel" girls, improperly dressed according to strict, Muslim customs, unattended by their husbands or parents are considered to be prostitutes and a sort of free prey, such as "infidel" sex slaves.

Intentional Muslim organization of mass rapist events, when it becomes entirely visible for the masses of the indigenous Christian (or secular) society raises doubts. The reason for that is quite simple. It is a very bad "advertisement" for further Muslim immigration to Europe that will surely continue. The potential awakening of the European indigenous Christian (secular) population in the number one country in terms of adopting masses of Muslim migrant population in Europe – that is clearly Germany at this time – could ring a powerful alarm bell. Such an awakening of the German majority population could result in policy changes, *fatal* for the consideration of a comparable level of adoption of Muslim migrants from Africa and the Middle East in the foreseeable future.

To show that it is even more complicated, the Quran is sometimes permissive, sometimes a little bit prohibitive when it comes to sex with infidels. [16] Since faithful Muslims consider all infidels as inferiors, and women – with no exaggeration – as property, there is no barrier preventing Muslims from committing sexual violence against unattended "infidel" young girls. Unfortunately, New Year's Eve in Germany was a "perfect event" when masses of unattended, 'infidel' young girls were in sight.

For those who truly believe in Western "political correctness" when it comes to gender issues, it is advised to visit the Quran in reference to sex slavery, especially regarding 'infidel' women. "Politically correct" people will most likely come into contradiction with their own beliefs, when they might attempt to justify whatever they find in the Quran. They might even come to a conclusion, that whenever they protest against "Islamophobia" when dealing with Muslim gang rapes throughout German cities in New Year's Eve, they become defenders of the sexism of Muslim males against indigenous Christian (or secular) women of their own nations, their own societies.

Since our first conclusion was that such mass sexual violence was a bad "advertisement" for Muslim immigrants, we tended to think that Muslims were not the main organizers of the violent attacks in German cities. We also assumed, that *the Muslim population in Germany is still far below the level of seriously considering terrorizing indigenous Christian population into submission* in the short run, whatever that might mean.

Such considerations resulted in our first conclusions, that – since truly religious (faithful) Muslim organization is unlikely – it could have been a case of "False Flag Operations", meaning the German secret services' "helped" to organize the violent attacks to "facilitate" certain policy changes by the German government. Even though it will most likely sound bad for "politically correct" analysts, such arguments appeared to be convincing for a while.

The motives of the organization of the rapist attacks in German cities could even be much worse, than "False Flag Operations" organized by German secret services aimed to somehow curb massive Muslim immigration to Germany, if the events mark a stage of Jihad.

Is Mass Migration a Stage of Jihad?

The suggestion that *Jihad itself is going on when organizing the entire Muslim migration flow affecting Europe* – not only the violent attacks on women in Germany on New Year's Eve – might shock us: "The wave of 'refugees' entering Europe in 2015 was an instance of the Islamic hijra, or migration, into infidel lands. It is one of the principal phases of jihad. In their migration Muslims are following the example of Mohammed, who made hijra to Medina and forcibly established Islam there. When the number of Muslims in the new land increases sufficiently – by further migration, or by da'wa, proselytizing to convert infidels – then violent jihad can be launched, and the final conversion of the new territory will be complete. Europe is experiencing the earliest stages of a major hijra operation." [17]

We had to check that Arabic terms do not mislead our analysis. We found 372,000 hits in a Google search for two key words: "hijra" and "jihad" on 21st February, 2016. "Migration is part of the doctrine of jihad. Migration is so important that the Islamic calendar is based upon the hijra, Mohammed's migration from Mecca to Medina. Why? Because it was migration that lead to the creation of jihad in Medina. And it was jihad that made Islam triumphant." [18]

If we agree that mass migration of Muslims is historically interpreted as a first stage of Jihad, which would later be followed by the establishment of an Islamic state, [19] [20] and that this could be the case concerning contemporary Europe, the entire way we view mass migration will change. Such a discovery truly shocked us since we have been responsible for migration issues in a Ministry of Defense and none of the "politically correct" sources we have ever read ever mentioned it. Even scholars lecturing us have omitted hijra.

We can argue that not all migrants entering Europe are Muslims. They – as individuals – all have different reasons why they want to settle in Europe. There are real refugees amongst them, escaping from war, violence, various forms of oppression, political persecution etc. Real refugees however are a minority in comparison with economic migrants who seek higher living standards. There is a powerful reason why they target *rich* European states with *high living standards* and well-developed social security systems, such as Germany or Sweden.

We are most likely unable to provide hard evidence that the majority of the Muslim migrants are entering Europe with a clear vision to later transform it to an Islamic State. They

might not even wish to colonize Europe in a cultural sense. [21] However, the problem is even if the Muslim migrants have different beliefs concerning the future of Europe, a historical transformation is going on with its challenges and opportunities. Even if at this stage we are far from having a Muslim majority in Europe, unlimited migration to Europe presents immense cultural and social dangers.

Integration must include education, employment and social cohesion. None of them are easy for the majority of Muslim immigrants. European languages are entirely different to those they spoke in their countries of origin. Many of them are illiterate, when they arrive in Europe. Finding a job could take years, [22] even when the language barrier appears to be overcome.

If Labor Force Considerations Play a Major Role in Shaping German Policies when Handling Migration, why are Masses of Muslim Migrants Preferred to Christian Ukrainians?

In Western democracies the people elect political parties, governments, and presidents etc. who represent the will of the population. However, elections are not the only factor determining the "political landscape" of countries: representatives (owners, lobbyists etc.) of big capital/business also heavily influence political decision-making. The question arises why there are no limits of migrant inflow from Muslim countries to Europe, especially to Germany. Is it the will of German big business to incorporate masses of migrants into the German labor market thereby making the German labor force cheaper? Is German big business indifferent to the fate of the country, the EU and the European culture and way of life when doing so? Is something similar going on, like what happened when the big capital of the car industry in Detroit relocated production to China where labor costs were significantly lower than in the US?

Such decisions of big business could prove to be successful, when we talk about logic of business, most importantly about profits of private companies worldwide. It is also suicidal concerning the social costs in the nation state that exported capital. We need to note that the key driver of private companies is clearly not to satisfy needs of a society including taking into account the cultural context, but to earn maximum profits. Such a logic leads to a terrifying conclusion, that German big business disregards the faith of the nation state and also Europe as a whole, when advising the chancellor to accommodate an unlimited amount of migrants from the Middle East, North Africa and Afghanistan.

We managed to share this disturbing analysis with our colleagues and there was no resistance at all against such a theory. They themselves emphasized the short-sightedness of big business when it comes to policy issues of the survival of European civilization. Luckily, we managed to cause confusion when we mentioned that the German state is clearly rejecting the mass cheap workforce that would come from Ukraine to be employed in Germany. [23] [24] [25] Our argument was that we are far from being an advocate of Ukrainian integration into EU, but these people could be far more easily integrated than Muslim migrants coming from war zones. Such German policies provided hope that the big business advising the chancellor is not following the logic of the economic and social destruction of Detroit in the United States, but is doing something else when the unstated policy goals are still unclear.

Why Uncontrolled and Unlimited Migration to Europe is Inhumane for the Migrants

Any "politically correct" attempts to cover up all sorts of problems related to uncontrolled mass migration to Europe, such as the dangers of the world's deadliest migration route through the Mediterranean, [26] [27] and the connection between migration and organized crime are ultimately bad for the migrants themselves. [28] Trafficking in human beings, sexual abuse, organ trafficking [29] [30] [31] are just few examples of connections between migration and organized crime. Countless problems affect migrants, such as a staggering amount of migrants – including children – missing after they have reached Europe. According to Europol data from January 2016, 10,000 unaccompanied migrant children have gone missing since entering Europe. [32] Organized criminal gangs are targeting immigrant children for sex work, slavery, organ trafficking etc. [33]

There is already a tendency that on one hand European social security systems are overwhelmed, on the other hand government aid to migrants is decreasing. [34] This is bad news if we consider the chances of the integration of masses of Muslim immigrants into European societies. We need to keep in mind that we are still at an early stage of the migration crisis that is apparently building up. Record numbers of migrants arrived to Europe in January 2016: 55,000 migrants entered the EU that is 35 times more than in the same period in 2015. [34] Even though it is too early to assess the number of migrants entering Europe in 2016, the tendency of more people coming in unfavorable weather conditions clearly points to the increase of migration pressure.

Ever increasing numbers of migrants in Europe combined with overwhelmed social security systems, growing crime rates, segregation and poverty of migrant population, growing frustration amongst the indigenous population against both migrants and government policies related to the handling of migration crisis etc. all point to ill treatment and discomfort amongst masses of migrants. If migration to Europe continues in an uncontrolled way, such tendencies would surely lead to the rise of social tensions and ultimately to radicalization.

Radicalization in this case is not limited to migrants, but also gains momentum amongst the indigenous Christian (secular) population. Far right parties that are intolerant towards masses of migrants are gaining public support. Such political changes in European countries affect the whole spectrum of handling the migration crisis including managing the fate of those migrants who are already citizens of European states. Such tendencies lay the foundations of social explosions and outbreaks of violence between the migrants and the indigenous population. The more social tensions build up, the more violence takes place, the more difficult it will be to reverse the negative tendencies.

Secret Pact between Germany and Turkey? Deliberate Betrayal of Europe Aimed at the Elimination of Nation States?

Politicians have made a big of huff around the issue of an alleged secret pact between Germany and Turkey in order to take up to 500,000 migrants from Turkey and settle them in Europe, forcing quotas on all EU countries, including those that do not agree with a mandatory quota system. The alleged existence of the pact is surrounded by secrecy – if true – it would prove

the truly undemocratic nature of the handling the migration crisis by great powers in Europe, in this case Germany and those on her side. It is unrealistic to blame Turkey for striking this deal with Germany, for it is a country where the overwhelming majority of people are Muslims.

However, the existence of the pact and its secrecy is clearly not the point, since facilitation of a legal migrant flow to Europe is becoming an official EU policy that is not secret at all. It is also obvious, that once up to 500,000 migrants from Turkey settle in Europe it would not end the migration crisis.

"This is betrayal, ladies and gentlemen! Europe has been betrayed! And if we do not stand up for it, this Europe will be taken away from us." [35] So declared Hungarian Prime Minister Viktor Orbán while condemning European leaders who have opened up the continent to waves of mostly Muslim Middle Eastern migrants.

It was not the first time Orbán had inveighed against migration, which threatens to upend European culture. And it further underlined the chasm separating politically correct Western Europe and what many would call a more culturally correct Eastern Europe.

Speaking to his countrymen, Orbán further warned, "Ladies and gentlemen, what we face is nothing less than the challenge of finding ourselves at the gateway to the implementation of a deliberate conceptual project, which could be described as left-wing and which seeks to marginalize the nation states of Europe. Where this project has failed to overcome Christianity and the identity of the nation state – and the values and responsibility springing from it – in conventional political struggle, it will strive to eliminate it on ethnic grounds." [35]

Orbán apparently was referring to the collectivist, open-borders, European Union mentality that seeks to replace nationalism with internationalism. And immigration facilitates this agenda. If countries can be so balkanized that there's no longer "a people" but rather just a disparate collection of 'peoples', there then will be little sense of nationhood and hence little resistance to a loss of sovereignty and dissolution of borders." [35]

There are several problems with this concept of marginalizing nation states. The concept of encouraging facilitated migrant inflow to Europe, thereby legalizing migration is very difficult to justify. Hungarian prime minister, Viktor Orbán summarized it as follows: "It's absurd [...] when the Germans say they will spend billions on providing for the new arrivals instead of giving the money to the countries around the crisis zone, where the [migrants] should be stopped in the first place. It would be better for everyone. They would not come here. It would cost less. And our approach couldn't be called into question morally either." [36]

Another problem with this concept is that once nation states are marginalized in Europe as a result of a massive Muslim migrant inflow and a forced quota system to settle migrants in all EU countries, the migrant flow will not stop. The marginalization of nation states could be viewed as a stage of handling the migration crisis in Europe, but not the end state.

We can argue that those EU leaders playing with fire when encouraging an ever more massive Muslim migrant inflow are not short-sighted and they will change policies once nation states in the EU are eliminated, but this is naïve. The ever growing Muslim population in the EU will find the way to be represented by political parties, pro-Muslim leaders who will encourage new waves of Muslim immigration to Europe. Why? Because the encouraged migrants are their "brothers" and an ever growing percentage of Muslim population is the ultimate guarantee for the transformation of Christian (secular) European societies to Muslim culture. This is a vicious circle.

Even if European politicians might wish to stop the uncontrolled inflow of Muslim migrants to Europe, once their goals to eliminate nation states within the EU are accomplished, it might well be too late.

Once it would be too late to save Europe from the transformation to a Muslim society, democracy will fail as well. Since there is no truly democratic country in the Muslim world, it is hopelessly naïve to assume that once a Muslim majority is achieved in Europe, democracy could prevail. *If this happens, marking the end of European culture and way of life it would be the biggest policy failure Western civilization has ever committed in history.*

Why NATO *de facto* does not Defend Europe, and is not Even Seriously Involved in Handling the Humanitarian Aspect of the Migration Crisis Affecting Europe?

On 11st February, 2016, news emerged from the NATO defense ministry that "NATO ships are being deployed to the Aegean Sea to deter people-smugglers taking migrants from Turkey to Greece." [37] NATO deploys 5 (!) ships altogether, 3 of them "urgently" (!) Do we really think, that 5 ships are an adequate answer when tackling the migration crisis affecting Europe? Do we really think that this would "change history"?

The same BBC article that provides the news that "NATO Chief Jens Stoltenberg said the mission would not be about "stopping or pushing back refugee boats" also stating that NATO wants to *deter* (!) human traffickers. What deterrence is that? It makes the whole effort truly ridiculous: even if those 5 ships might "disturb" the illegal migration flow, we make it clear officially, that the mission of NATO ships is not about "stopping or pushing back refugee boats". [37]

This is *ultimate impotence*. We deploy an obviously inadequate amount of ships to do something, to collect information, to monitor migration flow etc. and we make it clear that we do not want to stop or to push back refugees. Meanwhile, we equate true refugees with economic migrants, which might be "politically correct" but is also unfair if we take the needs of true refugees seriously. We wonder what the NATO secretary general, Stoltenberg, would say if a NATO ally with the *weakest navy* in the Alliance would stand up at the end of the ministerial announcing that their country would send *twice as many* warships to the same area at sea to tackle the migration crisis since they take the security situation – that includes the security of the migrants – seriously, *unlike NATO*.

The reason such an approach in tackling the migration crisis affecting Europe in NATO is clearly not the lack of capabilities or financial resources, but lack of political will to interpret the migration crisis *as a crisis*. NATO talks about "urgency" when deploying those 3 ships[3] yet it has nothing to do with tackling the migration flow to Europe at all, but about *deceiving the European indigenous population* frustrated by EU policies of handling the migration crisis.

What if we play the game entirely "politically correctly"? What if NATO is seriously concerned about the security and welfare of migrants, attempting to enter Europe? Is it the adequate response from NATO? Most probably not.

If NATO is truly concerned about the safety of the migrants coming from the South through the sea, the Alliance should have sent a huge fleet of warships and a significant

3 Such numbers are mostly omitted in main stream Western mass media and even in official reports addressed to the Hungarian Ministry of Defense.

amount of reconnaissance aircraft, also intensifying satellite surveillance to make sure that migrants would sail safely to enter Europe legally. That would be an effort comparable to what NATO is capable of doing. Since it is not done, *the question arises whether the Alliance is "politically correct". No, it is not, not even by its own terms.*

Possible Scenarios of Handling the Migration Crisis Affecting Europe

There are two extremist scenarios when tackling the migration crisis affecting Europe. One extremist "solution" is to allow uncontrolled migration to Europe, leaving our borders wide open. In this case the growing migration pressure will provide an ever increasing amount of migrants, most of them entering Europe in hope of a better life. A new Muslim majority will become a reality and the migration process will most likely be far from over. European living standards, social security systems would collapse. European civilization and way of life would cease to exist.

If migration inflow to Europe is not simply "uncontrolled", but *deliberately encouraged and facilitated*, that is an even more extremist way of tackling the migration crisis, bringing the very same or similar results as discussed in the previous paragraph.

The other extremist scenario is a creation of "fortress Europe" with tight border control equaling to a new "iron curtain" that prevents all forms of migration including true asylum seekers. This scenario might be considered inhumane, but ensures the survival of European culture and way of life.

There are countless possibilities between the two extremes. True asylum seekers could be adopted, economic migrants could be refused. Depending on the definition of true asylum seekers, a limited amount of migrant inflow could provide a balance, when European culture and way of life is unharmed, and the speed of assimilation of migrants is in balance with migrant inflow.

An intermediate scenario could be that some countries in Europe close their borders and do not allow the migrants to enter and settle. Others might be unwilling or unable to close their borders allowing a migrant flow through their country. If the migrant flow continues, a growing number of migrants would find themselves in various countries in Europe, along the closed borders. This could easily lead to a humanitarian disaster and collapse of societies. Such a scenario is building up in the Balkans, if some countries, such as Austria keep their promises and close their borders.

Recommendations for European Policy Makers

European policy makers have to make choices. No matter what policies they might support, they should clarify the reasons why they support certain policies while denying others.

References to human rights of the migrants are nice, but the interests of the majority, indigenous European populations should not be sacrificed for the benefit for an unlimited migrant population, that could soon be the new majority in Europe, if unlimited migration flow would further continue. Especially, if no limitations of the migration flow would encourage further tens or even hundreds of millions of migrants to enter Europe in a hope of a wealthier life.

If those politicians who support unlimited Muslim immigration to Europe believe, that it would solve the labor force problems of an aging Europe, they are wrong. There is unemployment amongst the indigenous European population in the EU that proves that migrant flow would make their chances to find a decent job even worse.

If European politicians, who support an unlimited migrant flow to Europe hope that they can lower wages of indigenous Europeans, who are considered to be a "too expensive" labor force, they are wrong again. Lowering wages means lower production costs but also lower purchasing power that together – since the masses of average employees consume the majority of goods – would be a disastrous tendency. Europe cannot truly compete with China or India where labor costs are truly low. That would be a reversal of anything left of the welfare states in Europe and the indigenous population will eventually rise up against such tendencies.

We also need to note, that technological development that tends to utilize ever more intelligent technologies, and will thus make the contribution of poorly skilled employees useless. The integration of a skilled workforce, such as engineers or medical doctors, could be relatively easy in Europe. Unfortunately, the bulk of the migrant population who are at best poorly educated in European terms, would become a burden to our economies. That sad reality would force masses of Muslim migrants into ghettoes, unemployment, poverty, crime and ultimately terrorism. This is exactly the opposite of what de-radicalization might mean. This is the European cultural and economic trap that we create for ourselves and we have become the ultimate victims of our own policies. Such tendencies will surely overwhelm European social security systems far before Muslim migrants become a majority in Europe.

The bottom line is that if European politicians expect greater profits from an unlimited migration flow to Europe, they are wrong and short-sighted.

The solution to the migration crisis affecting Europe also demands foreign policy changes in the Middle East, North Africa and Afghanistan. "Here is the real solution to the refugee problem: stop meddling in the affairs of other countries. Embrace the prosperity that comes with a peaceful foreign policy, not the poverty that goes with running an empire." [1]

Conclusions

- Western interventions in the Middle East, North Africa and Afghanistan resulted in wars, lasting chaos and instability. Interventionism – rather than conflict prevention – led to Islamist radicalization, rise of terrorism and increased migration pressure on Europe.
- European integration of Muslim migrant populations has mostly failed over the past several decades.
- Literal and rigorous interpretation of the Quran creates a firm basis for Islamic fundamentalist violence, including terrorism.
- Current handling of the new migration wave in 2015 proved European lack of understanding of the graveness of the problem, weakness, incapability to raise and answer fundamental questions, lack of unity of policies and efforts.
- Since the migration pressure on Europe will most likely increase and will be a long-term challenge, unchanged policies of handling the migration crisis and failures of de-radicalization and reintegration of Muslim migrants will lead to disastrous consequences including the endangering of the European way of life as a whole.

- Russia payed a high price in losses of human lives and destruction at the initial phase of the Chechnya crisis, but installing the Kadyrov dictatorship resulted in a remarkably successfully settlement.
- Russia has a great chance to militarily succeed against ISIS and other terrorist organizations in Syria. The successful Russian war efforts combined with the reinstallation of the Assad regime will likely bring peace and stability to the war torn country.
- Western and Russian military interventions – as a broad interpretation of de-radicalization – are quite similar in their nature. However, Western export of democracy is exactly the opposite of Russian installation of dictatorships.
- Russian de-radicalization efforts in Syria and possibly in Iraq and Libya have a great chance to ease the migration pressure on Europe.
- Unchanged Western policies in the Middle East, North Africa and Afghanistan have had a great chance to contribute to an ever more severe migration crisis and Muslim radicalization hitting Europe since 2015.
- While Western democracy export is bound to fail in Muslim countries, Russian installation of "home grown" dictatorships loyal to Moscow have great chances to succeed.
- Since there are no truly democratic countries in the Muslim world, Russian installation of "home grown" dictatorships is the logical answer.
- For similar reasons we cannot expect "political correctness" towards indigenous population, when Muslims might become a majority in Europe. "Political correctness" is strictly a Western intervention that works in Western environments, in addition to Japan.
- The rise of ISIS is the most obvious and disastrous policy failure of the Western export of democracy to the Muslim world.
- ISIS poses the biggest security threat not only in the Middle East, but against Europe and Russia as well.
- The Western world – especially the US – are not doing their best to eradicate ISIS.
- The interpretation of the migration crisis effecting Europe as an early stage of Jihad is a shocking discovery, even if the majority of Muslims migrants might not have such a firm plan at this time.
- The uncontrolled migration flow to Europe is harmful not only for the indigenous European population, culture and way of life but also for the majority of the migrants themselves.

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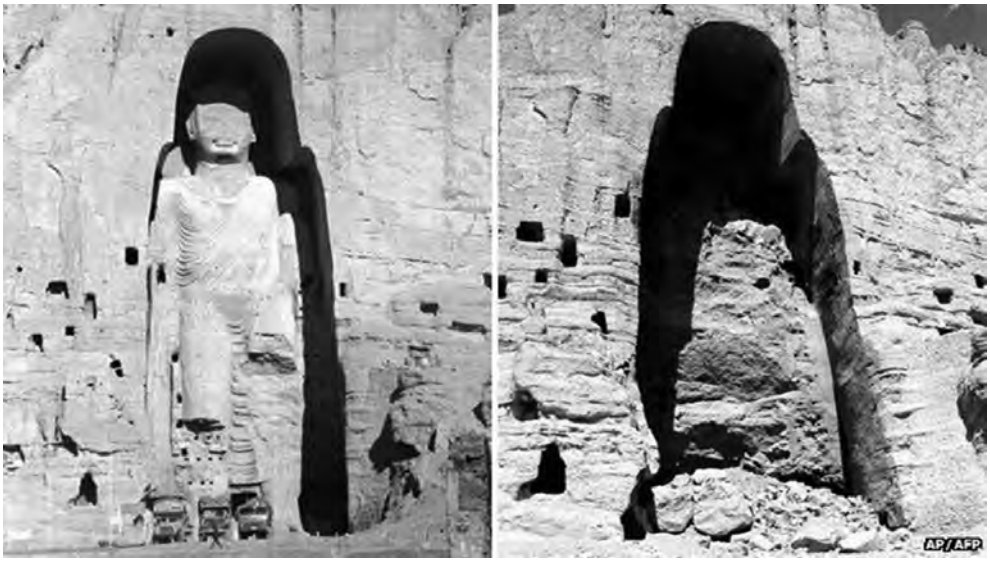
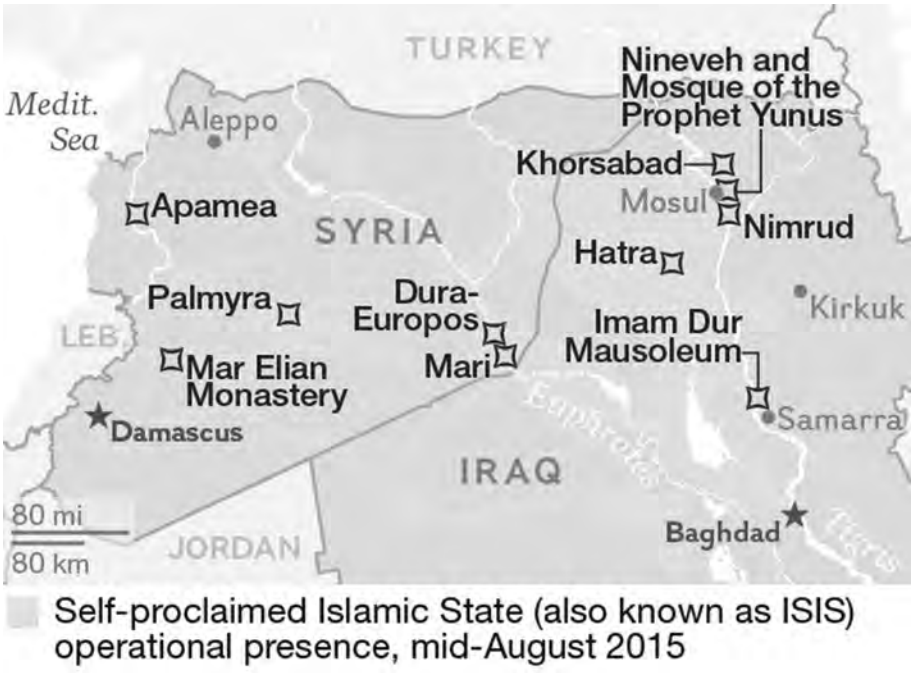
Annexes



Annex 1. The Bamiyan Buddhas before and after destruction by the Taliban.
Source: BBC www.bbc.com/news/world-asia-31813681 (Downloaded: 12 04 2016)



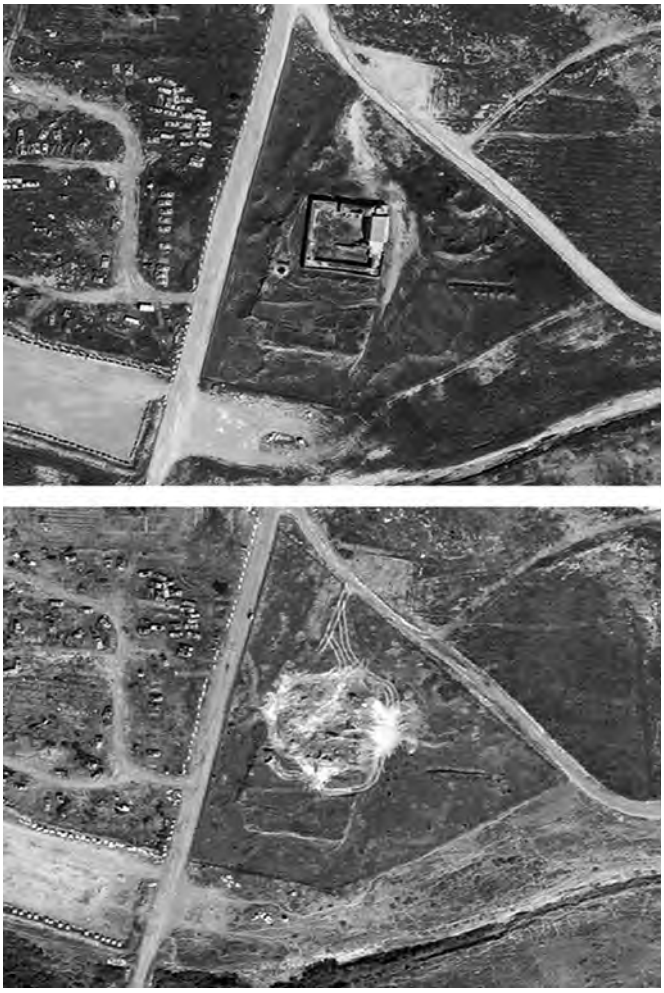
Annex 2. NG maps.
Source: Institute for the Study of War.

Some major historic sites destroyed by ISIS until mid-August 2015.

Source: http://news.nationalgeographic.com/2015/09/150901-isis-destruction-looting-ancient-sites-iraq-syria-archaeology/ (Downloaded: 04 04 2016)

Annex 3. The view of the 1400 years old St. Eliah's monastery in Mosul prior to destruction by ISIS.

Source: Pravmir. www.pravmir.com/iraq-s-oldest-christian-monastery-destroyed-by-ISIS/ (Downloaded: 04 04 2016)



Annex 4. The 1400 years old St. Eliah's monastery in Mosul before and after destruction by ISIS. Source: The Guardian. www.theguardian.com/world/2016/jan/20/ISIS-has-destroyed-iraqs-oldest-christian-monastery-satellite-images-confirm (Downloaded: 04 04 2016)

Annex 5. The Temple of Baal Shamin at Palmyra when destroyed by ISIS.

Source: National Geographic. http://news.nationalgeographic.com/2015/09/150901-ISIS-destruction-looting-ancient-sites-iraq-syria-archaeology/ (Downloaded: 04 04 2016)

Annex 6. Iconoclasm: Catholic Altar Piece.[4]

Source: www.boundless.com/art-history/textbooks/boundless-art-history-textbook/northern-europe-and-the-iberian-peninsula-in-the-1500s-ce-26/the-reformation-163/the-reformation-625-5818/ (Downloaded: 04 04 2016)

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Employment of Women in Indian and Hungarian Armed Forces – A Comparative Study

Mukhwinder KAUR[1]

The establishment of armed forces has roots deep in history, times when the proportion in men in arms of any country was higher than that of women. Nowadays in most countries women have equal rights to participate in almost all the working sectors of any nation. However, the participation of women in the Indian Army was initiated in 1992 whereas it was founded in 1895. In the 19th century women got their place in defense forces with a limited quota to serve. This paper will deal with female recruitment issues in the armed forces of India and Hungary.
Keywords: *women in military, India, Hungary, employment, reservation, NATO*

> *"Those who always speak well of women do not know them enough; those who always speak ill of them do not know them at all..."* [1: 157]

This article presents the first ideas and impressions on women in defense forces of two very different countries. As a Ph.D. student of the Faculty of Military Science and Officer Education of the National University of Public Service it is the author's aim to develop it into a full thesis in the years to come. As the introduction of a comparative study addressing gender issues it sets the scene for international comparative research of a much larger scale based on the analysis of multiple factors.

Two Militaries, Two Practices

In the past centuries the role of women in certain professions was often limited by male dominating societies, but slowly and gradually women have earned their space in nearly all walks of life. Perhaps there is no area which has been more resistant to the full participation of women than the military. Here, as in no other profession, long-standing ideas about the traits and abilities of the two genders have kept the military predominantly male and male controlled until well into the 1900s. [1: 157] The introduction of female officers to the Indian Army was approved in 1992 by the Cabinet Committee on Parliamentary Affairs as short service commission cadre. The first batch consisted of 25 female officers who were commissioned into the Army Service Corps (ASC), the Army Ordnance Corps (AOC), the Army Education Corps (AEC) and the Judge Advocate General (JAG) departments in March 1993. The initial terms of engagement for female officers in the Indian Armed Forces (IAF) was five years, which got extended to ten years over the period of time, with the option of

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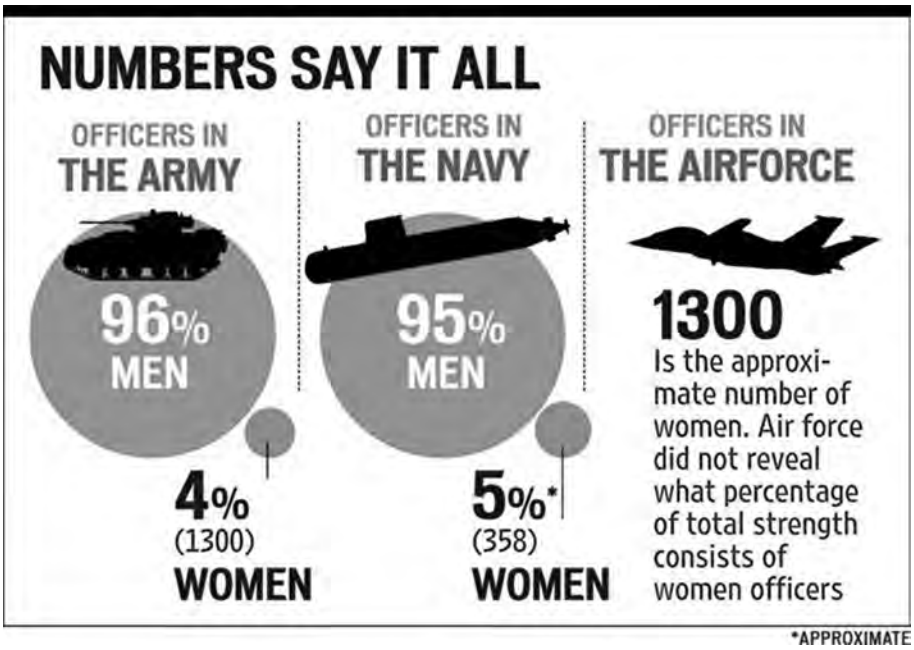
extension by another four years in the service. Permanent commission of female officers was granted in 2008 to work in the AEC and JAG departments. [2] In Hungary, it was in the mid-1990s that real carrier opportunities were opened for servicewomen. Since Hungary abolished compulsory military service in 2004, an increased interest in military service can be observed. Despite the increase of the number of women in armed forces their contributions are not very publicized and rewarded. In Hungarian Defense Forces (HDF) women served first as nurses, but today women participate in different branches of the HDF. [1: 157]

The number of vacancies as announced by the Government for the 99th Short Service Commission Course (for men) is 175, and for the 13th Short Service Commission Women (Non-Technical) Course is only 12. [5] Although female officers were first introduced to the Indian Army in 1993, their percentage in 2015 is still not significant as they comprise just 4% of the officer corps of the Indian Army and only just 5% of the Indian Navy. [6]



Picture 1. Female Officers strength in Indian Armed Forces. [6]

In comparison with other NATO countries, the HDF have a relatively high proportion of professional female soldiers in many fields. The total percentage of female professional and contracted soldiers (19.6%) covers even higher rates in some ranks. Although there are still no female flag officers, women serve in every other officer rank. Despite the continuous downsizing of the HDF the military ratio of servicewomen, especially among NCO's (*non-commissioned officer*) is still on the rise. [1: 87] [1: 158] [3] Among junior officers the rate of females is over 20%, among contracted personnel it is even higher. Every second officer from OF–2 (Officers [OF 1–10]) and every third of OF–1 is now female. This shows that besides professional military education, highly educated civilian females tend to join the army and accept the special circumstances of living in uniform. Even if their majority is

in so-called special positions with rather slow and defined advance, many of them might be promoted to higher officer ranks in 5–10 years, if it is possible to keep them in service. [4] Combat positions are also open for women in the HDF forces since 1996. There are no regulations, nor confirmations concerning allowed or forbidden branches and services for servicewomen. [4]

Table 1. Female Personal Strength in Hungary 2008. [4]

Hungary	**Total %**	**Flag Officer**
Joint Force Command (JFC)	15.7	–
Ministry of Defense (MoD)	33.7	–
Defense Staff Units	29.7	–
Total	20.2	–

According to the HDF Budget Management Information System, as of November, 2015, the proportion of women in the Land Forces was 18%, in the Air Force 22%, for the Ministry and the HDF Joint Force Command 33%, at the background institutions of the MoD and at the direct MoD subordinate organizations 36%, Hungarian Defense Forces Health Centre 73%.

Major Employment Challenges

The Delhi High Court announced it would not allow *"sexist bias"* to block women's progress. Female officers in the IAF were not entitled to a pension as a minimum 20 years of service was required. However, on 5th September, 2015 a landmark judgment at the Delhi High Court announced women to be granted with permanent commission in the Navy, ensuring that female naval officers enjoy rights similar to their male counterparts in the Army and the Air Force. Female naval officers were not eligible for pension, since it required a minimum of 20 years of service. The petitions were filed by a group of female officers, both retired and serving, from the logistics, education and air traffic control departments of the Navy. [7]

Hungary participates in NATO missions, in which all positions are open to women. Yet most servicewomen serve in medical, public information, communication, administration or logistic roles, and only a few of them serve in infantry squads or other combat positions. The participation of Hungarian female soldiers in multinational operations is successful. There are officers, NCO's and contracts in every mission the HDF participates in. They have to meet the same requirements, and live under the same conditions as men. [1: 165] In contrast the bulk of the Indian Army is deployed in rugged areas of the country. The posts are isolated and basic facilities are not available for months and operational tasking warrant working in close proximity with men. There are roughly a dozen nations that have opened *close combat roles* to women; however, it has taken them a decade to go through the process of integration. In the Indian context, induction of women in combat arms can be considered in a graduated manner, provided they meet the desired physical and professional standards. In the training academy, female officer candidates volunteering to join the combat arms need to pass the same tests as are applicable to male cadets to be posted to the combat arms as young officers. [2] In the HDF the main motivation of servicemen and women are the financials benefits, because the difference between the peacetime salary and salary in missions is significant.

Secondary motivation is the evaluation system as it is seen an advantage to have mission experiences gained abroad. [1]

A recent research project titled *"Women Officers in Indian Army and Work Environment: Indian Perspective"* surveyed 600 seniors, juniors, peers, subordinates, women officers and parents. A mixed response was found to the question of whether women officers were willing to lead male troops on a patrol or an ambush. It was noted that female officers with lower age in the service group of one to four years felt thrilled, considering it an adventure activity. Married female officers in the service group of five to eight years considered this out of context and felt nervous and bewildered at the thought of a single woman amongst male soldiers. Some senior officers were evasive and non-committal while the majority were not in favor of sending female officers on night duty or on ambush and convoy protection duties in counter-insurgency areas. Hungarian Armed forces physical fitness is tested for all personnel annually. Each soldier must meet those requirements in order to be suitable for further military service. The fitness test consists of the same elements (3200 m running, push-ups, sit-ups), but differs by gender and age. [8] [10]

Steps were taken to build up the family support system. If married couples with children serve in the army, and one of them is on a mission abroad, the other family member with child younger than six years old is exempt from 24 hours duty. The army adopted the civilian law on maternal leave, according to which servicewomen are entitled to six months of maternity leave. After this period they can be assigned to personnel reserve status for one more year. [1: 166]

In the Indian Army due to certain social and domestic obligations and physical constraint, military service poses a greater challenge for female officers in comparison to their male counterparts. Their role as wife and/or mother adversely affects their availability to the organization, more so at sub-unit level, where the deficiency of officers is maximum. Maternity leave of 180 days, 60 days each of annual leave and furlough deny a unit of an officer for 10 months with no relief forthcoming. [2] With women forming nearly half of the Indian population, there is a mandated requirement to ensure their proportionate representation in the Services in a graduated manner, keeping the exigencies of the respective Service in mind. With a focus of war-fighting shifting from contact to more technologically advanced battles, proliferated with sophisticated platforms and non-contact standoff operations in the realm of cyber, space, intelligence and perception management, adequate avenues increasingly exist for the employment of women in the Indian Army. [2]

Though most developed countries have female officers commanding certain non-combat units, women are also enrolled in all ranks. In the Indian context, the prevailing service conditions, socio-cultural mind sets, limited command experience and employment of women only as officers has precluded assignments of command responsibilities to female officers. [2] If one compares women in the Indian Navy with women in the Royal British Navy the differences become visible. In the latter 71% of jobs are open for women in the logistics and warfare branches. Women are commanding or executive officers of various vessels such as mine-hunters and frigates. Sixteen women qualified as principal warfare officers, six as pilots and 22 as observers. Approximately 1200 women serve in a selection of 57 ships in all ranks and rates. A further 130 are serving in other operational or sea-going posts with the remaining being shore-based or under training. [9] There are also females commanding reserve forces units. Servicewomen also fill a variety of roles in operational theatres including Iraq, Afghanistan and the Balkans.

Picture 2. Two Typical Cases. [6]

Recently in the Indian Air Force women were allowed to apply for the fighter pilot position. Due to cultural biases and preconception the reaction of male Indians to this opportunity was not highly positive. People of the nation do not believe in the capacity of female officers in the IAF as the troops will not accept a female officer as their leader because of the cultural barriers about women.

Conclusion

Do You Have It in You? The army recruitment information pamphlets with this line fills the aspirants with high morale but it is time female officers asked themselves *If They Have It in Them?*

Unlike in Hungary, the resolution of possible conflicts in India requires a bilateral compromise, since the women have to be part of it with empathy and in a positive way in order to resolve the organizational conflicts which represent masculine values. The measure of the acceptance of women is possible only on the basis of equal performance and treatment. In other words women rightfully expect objective evaluation on the basis of their performance, but they must then accept the results of it. [1: 166]

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Data Mining in Cyber Threat Analysis – Neural Networks for Intrusion Detection

Eszter Katalin BOGNÁR[1]

The most important features and constraints of the commercial intrusion detection (IDS) and prevention (IPS) systems and the possibility of application of artificial intelligence and neural networks such as IDS or IPS were investigated. A neural network was trained using the Levenberg-Marquardt backpropagation algorithm and applied on the Knowledge Discovery and Data Mining (KDD)'99 [14] reference dataset. A very high (99.9985%) accuracy and rather low (3.006%) false alert rate was achieved, but only at the expense of high memory consumption and low computation speed. To overcome these limitations, the selection of training data size was investigated. Result shows that a neural network trained on ca. 50,000 data is enough to achieve a detection accuracy of 99.82%.
Keywords: *IT security, intrusion detection, neural networks*

Introduction

At present, all the most important companies use a complex, highly interactive IT system to support their operation. The security of the IT system has a high-priority, as an increasing amount of transmitted and stored data is generated.

There are several widely used methods to prevent the unauthorized intrusions to networks, like the application of user identification, firewall and antiviral softwares. However, these methods due to their vulnerability are unable to provide a maximal security. To ensure the confidentiality, integrity and the accessibility of transmitted or stored highly relevant information for authorized users are great challenges, therefore a complex, multi-layer security system is required.

The application of IDS and IPS systems is one of the most efficient solutions to improve the network security, where the unauthorized intrusions into the network are detected and the harmful effects and attacks are prevented using a proper security system (e.g. packet filter firewall).

In the first part of the paper the role and relevance of IDS and IPS systems in the network security are described. In the subsequent part the application's efficiency of neural networks in the detection of network intrusion is investigated using a reference dataset. The analysis of this investigation proves the relevance of the new generation of IDS system; the anomaly-based detection.

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IDS and IPS Systems

For the protection of an information system a multi-layer approach is applied. The key element of this system is the user identification on the basis of biometrical, key and knowledge features. The different firewalls represent higher level protection, however, they act only as filters, which are unable to identify the intruders that have already penetrated the filter and protect against internal attacks.

Those highly-secure IT systems require further protections, whose important components are the IDS and IPS systems. The term of intrusion detection/prevention system refers to their major task; the detection and prevention of the internal and external attacks affecting the host or the network. They act as alarm systems, monitor permanently the network traffic and the host events, and report to an authorized person (administrator), if any unusual activity is detected. The administrator analyses the provided information and activates the system to prevent successfully the attacks.

Signature and Anomaly-Based Systems

At present that signature based detection is applied mostly which stores well-known attack patterns as rule in the database, and the unauthorized intrusion trials are tested and removed, if they match with previously stored rules. This solution has a disadvantage of storing large amount of data and identifying new types of attacks only after the refreshment of the database. The recent IDS and IPS systems require permanent user control, the reports should be monitored and the database should be extended with the new rules matching with the pattern.

To improve the accuracy of IDS and IPS systems a new approach, the anomaly-based detection has been recently developed. The main feature of the anomaly-based detection system is that normal user activity is modeled using statistical methods and every deviation from this behavior is classified as an anomaly. This method is in sharp contrast to signature based detection, where specifically the attack patterns are investigated. This approach has an advantage of detecting even such intrusions, which have not been identified and stored yet in the database. Although the anomaly-based detection method seems to be promising, but it has not been introduced yet due to its complexity and high resource requirements. [1]

Figure 1 shows the structure of an anomaly network-based IDS.

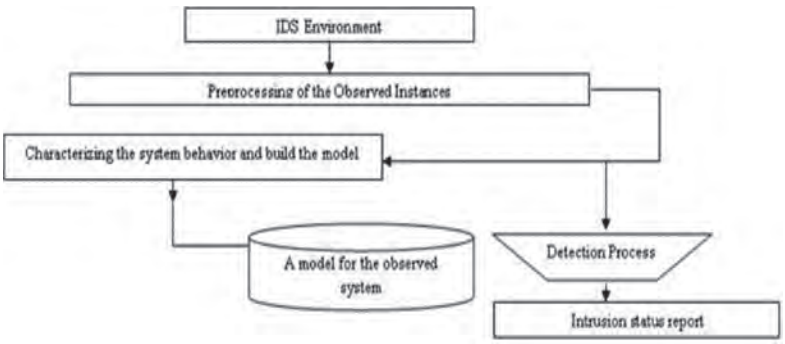


Figure 1. The structure of anomaly network-based IDS. [2: 28]

Overview about Relevant Publications

There are several methods to implement the anomaly-based IDS and to describe normal user behavior. In this section machine learning is described in more detail. Although machine learning is a very popular research field today and a lot of papers have reported about very high (98%) detection ratio and very low (1%) false alert, yet the signature based IDS are still much more preferred. Although in some applications the machine learning systems proved highly efficient, their implementation is rather difficult, consequently the method did not bring a decisive breakthrough. Robin Sommer and Vern Paxson analyzed in their paper Outside the Closed World: *On Using Machine Learning For Network Intrusion Detection* [3] the pitfalls of the implementation: there is not any dataset for teaching the system, the cost of the problem management, the deviations between the reported results and real operation, and the large variability of input data.

Despite these difficulties several attempts were made to implement the anomaly-based IDS using machine learning methods. Denning [4] published first in 1987 about the implementation of a host based IDS system using statistical metrics and profiles.

Other techniques based on machine learning, like genetic algorithm and application of neural network are also widely used and a lot of results were published in this topic. Susan M. Bridges and Rayford B. Vaughn [5] implemented their IDS using fuzzy data mining and genetic algorithm, consequently they proved that the application of genetic algorithm is highly useful to select the most important features characteristic to the attack. Some notable machine learning based systems are the netGA [6] and the system of the University of Minnesota called MINDS. [7] In this topic another work should be mentioned: Hua Tang, Shaolin Cao [8] and Chunmin Qiu, Jie Shan [9] implemented a system using neural networks and the application of the backpropagation algorithm were investigated in [10] and [11].

Method

For the analysis the MathWorks MATLAB [13] was applied with internal neural network components, while for teaching and testing the KDD'99 dataset was used. The algorithm was running on 10% of the KDD'99 dataset during the teaching period, and subsequently 500,000 elements from the test dataset was used to test the efficiency of the neural network and evaluate the results.

Neural Networks

The main goal of neural network research is to understand the information processing and the learning process of the human brain to model the behavior of a human.

The human brain is capable of achieving outstanding performance, to process the information parallel via multiple connections of neurons and to adapt to the changing environment, thus to learn, organize and collect information. It can both generalize and specialize, which is highly advantageous for thinking. The neural networks are designed to the similarity to the human brain. Although the model of human thinking is still too simple, the application of neural networks solved several problems, where the statistical methods failed. The neural

networks are capable of processing the information in parallel, and adapt and learn. If incorrect, noisy input data are provided, the neural network is still capable of achieving correct results. The application of neural networks is an important area of data mining. In case of a large amount of variable data this technique provides the best result. [12] As the network traffic generates a large amount of noisy data, therefore the application of neural networks proves an ideal solution.

Working with the KDD'99 Dataset

How successfully the neural network is taught, depends mostly on the dataset. It is very difficult to find a standardized and freely available dataset. After a proper analysis of the literature the KDD'99 was chosen.

The dataset was generated with a typical US Air Force LAN simulation, TCPDUMP [15] data were collected during seven weeks and several attacks were generated in this period. At final status the dataset contains roughly 5 million records. Each TCP/IP connection was associated with 42 different numerical and non-numerical variables, and in the dataset for each record the 42nd value indicates, whether it is a normal connection or an attack. The name of the attack is indicated, as well.

Table 1 shows the number of attacks and normal connections in the dataset.

Table 1. The number of different records (attack or normal connection) in the training dataset. [Made by the author.]

Attacks	3,925,650
Normal connections	972,781
Total	4,898,431

The values in the dataset can be categorized into three different groups: basic features related to the TCP connections, content features related to the connection and the values referring to the data transmission in the 2 sec time window. The dataset is divided into two groups: one part for teaching and the rest for testing the efficiency of the neural network. The records used for the test contain unknown attacks, as well.

The intrusions can be categorized into four groups:

- *Denial of Service* (DoS) attacks: The intruder blocks/inhibits the accessibility of the system by overuse of the processor/memory, therefore the authorized users cannot access the resources.
- *User to root* (U2R) attacks: The intruder has a user right, but abuses the system to get a root access due to the vulnerability of the system.
- *Remote to user* (R2L) attacks: The intruder monitors the system externally and gets user right by abusing the security of the system.
- *Probing* (PROBE): The intruder collects information about the weak points of the system by scanning (e. g. port scanning).

Coding and Preparing the Dataset

Data standardization is required in the dataset to handle properly the values by the neural network. There are both numerical and non-numerical values among the 42 attributes. [16] As the MATLAB operates with numerical matrices, it was necessary to modify the dataset, that each discrete output value is associated with numerical values.

For simplicity the attack types in the last column are not handled separately, but all attacks are coded with 1, and all normal behaviors are coded with 0. This type of data reduction simplifies the learning process significantly, because the output vector has a single value, which is either 1 or 0.

Backpropagation Algorithm

The Levenberg-Marquardt backpropagation algorithm [17] was used for the analysis.

The learning process is supervised during the run of the backpropagation algorithm, which means that input patterns are provided for the network and the expected output value associated with the input patterns is defined, as well. The network compares the output value for the actual weights with the expected output value and modifies the weights so that the difference between the actual and expected output values becomes as small as possible.

The backpropagation model is a multiple layer model therefore it contains several hidden layers with further junction points between the input and output layers.

Running the Algorithm

The algorithm requires input and expected output values. The dataset used for the teaching is 10% of the total KDD dataset and is coded as described above. The first 41 attributes in the dataset corresponds to the input vector, while the value in the 42nd column coding the attack and normal behavior represents the expected output for the network.

The number of hidden layers is an important parameter. The more layers are in the network the more precisely the network can learn the input dataset. However, there is a risk of overtraining, which affects the network as well. The network recognizes only the values, which are very similar to the input data, consequently it cannot generalize and adapt anymore. These lost features are the major advantage of the neural networks. The large number of hidden layers prolongs the learning time too. The most important advantage of the anomaly-based IDS is the capability to recognize new types of attacks, therefore it is very important to avoid overtraining. Additionally the analysis of the network traffic should be done optimally in real time, so the time for teaching should be decreased as low as possible. By taking into account these facts the number of layers was chosen to be 10 and this value was tested and proved a proper selection.

Efficiency Test of the Neural Network

The operation of the network is tested on 500,000 data selected randomly from the first 697,513 rows of the test dataset.

The output value is a floating point number between 0 and 1, an approximate value provided by the network. The output values are coded with 1 and 0, for the attacks and normal behavior, respectively. Furthermore the upper and lower threshold output values should be defined as well: above or below this value the output is classified as an attack (1) or normal behavior (0). The selection of the optimal threshold values was investigated and found to be highly crucial.

For the analysis of the network efficiency 5 criteria were taken into account: true positive, false positive, true negative, false negative and the accuracy.

The true positive value indicates the ratio of correctly interpreted attacks – when the network correctly identifies the attack – relative to the total number of attacks in the test dataset.

The false positive value is the opposite of the true positive value. In this case even the normal behavior is classified as an attack.

The true negative value similarly indicates the ratio of correctly interpreted normal behavior data in the whole dataset. The false negative measures the ratio of unidentified attacks, when the network does not detect the attack and code as a normal behavior.

Accuracy was calculated taking the sum of true positive and true negative values, divided by the number of data in the dataset.

Evaluation of the Results

The Receiver Operating Characteristic (ROC) analysis [18] was used for the evaluation and illustration of the results and the evaluation criteria introduced in the previous chapter were plotted as a ROC curve. The test was carried out on a dataset with 500,000 elements selected from the KDD'99 dataset. On the basis of statistical analyses the dataset seemed to be suitable for the test, because all types of the attacks are included and the normal and the attack type behavior are represented equally.

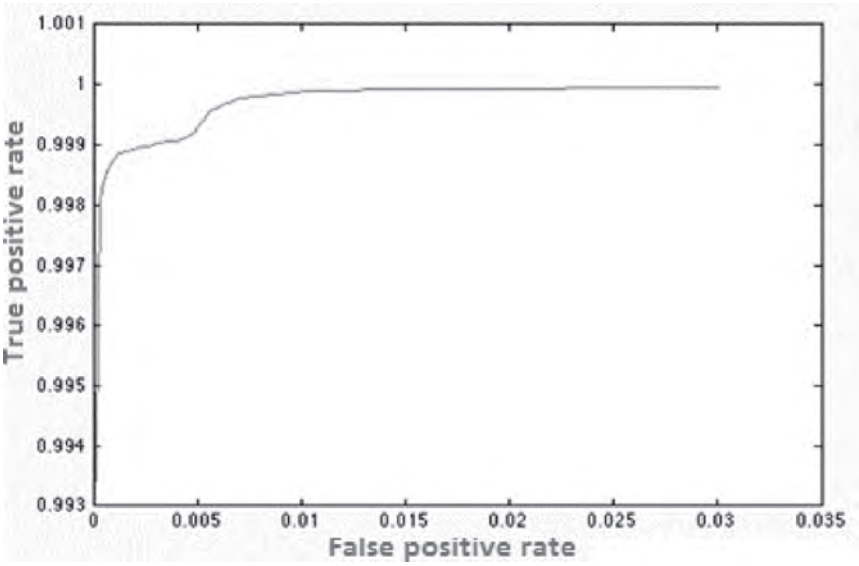
Table 2. Ratio of normal and attack type rows in the test dataset.
[Made by the author.]

Attacks	304,499
Normal connections	392,014
Total	697,513

First it was investigated how the network can distinguish after intensive training with a high number of data between normal behavior and attacks on unknown dataset.

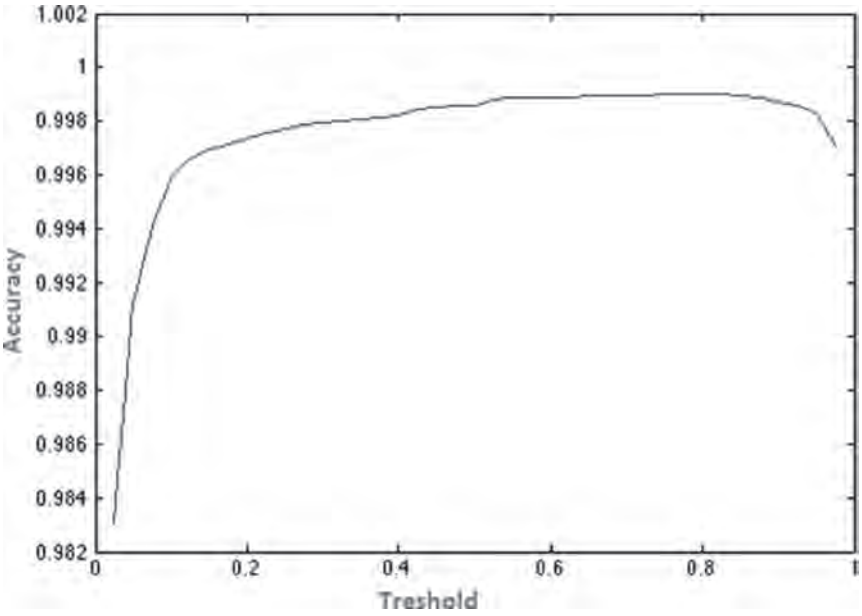
The following results were obtained after the training on 100% of the training dataset:

It can be clearly seen on Graph 1 that more precise detection of attacks accompanies a higher number of false alerts. 99.994% true positive rates can be achieved at false alert value of 3.006%. The optimal ratio depends on the demands of the company operating the IDS.



Graph 1. The ratio of correctly detected attacks and false alerts.
[Made by the author.]

An important parameter, the connection between the threshold value and the accuracy was investigated. The maximum accuracy can be achieved at the threshold value of 0.8, but roughly at around 0.5 and 0.6 a proper accuracy can be expected. (Graph 2)

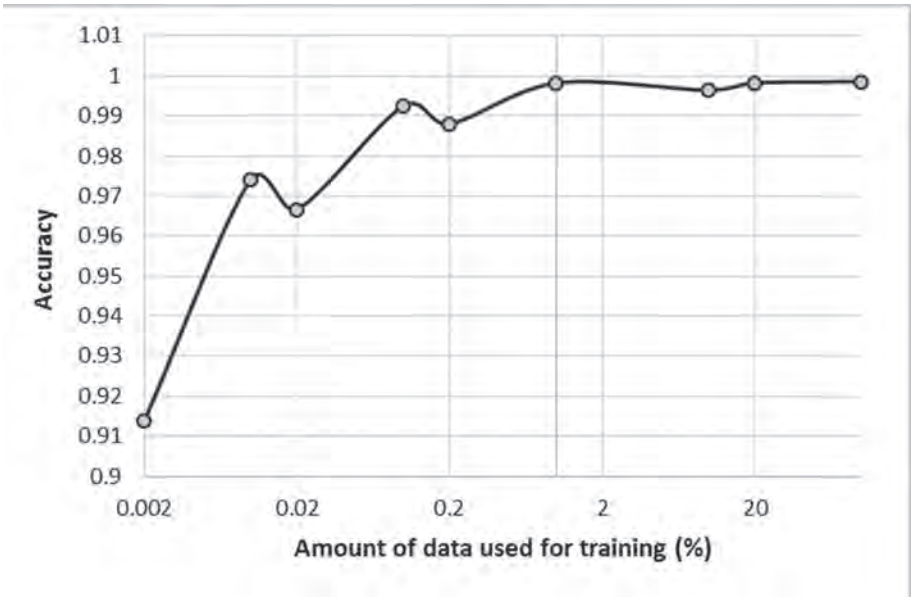


Graph 2. The dependence of the accuracy on the threshold values.
[Made by the author.]

Another interesting question was investigated, namely, how the size of the dataset used for the training influences the performance of the neural network. Several test runs were performed on different percentage of the dataset (0.002, 0.01, 0.02, 0.1, 0.2, 1, 20 and 100%) and Table 3 and Graph 3 show the corresponding accuracy.

Table 3. The accuracy of the neural network and the data used for training.
[Made by the author.]

Training %	Accuracy
0.002	0.913828
0.01	0.974154
0.02	0.966624
0.1	0.99249
0.2	0.988058
1	0.998218
10	0.996454
20	0.998246
100	0.998584



Graph 3. The accuracy of the neural network as a function of the amount of data used for training.
[Made by the author.]

In order to reach the maximum value, it is enough to teach the 1% of the complete dataset. If the training was performed on few data, the accuracy value fluctuates a lot, while the training on high number of data provides a stable accuracy close to the maximum value. This feature is very important for the IDS systems, because the capability of the system to learn on few data helps to monitor effectively the network traffic and to adapt successfully to the permanent change of the user behavior on the network.

According to the obtained data the neural network was able to learn effectively the user behavior, therefore it can distinguish between the normal and attack type behavior very precisely even on unknown data.

Summary, Future Work

This article introduced the possibility of application of artificial intelligence and neural network as IDS or IPS. A very high (99.9985%) accuracy and rather low (3.006%) false alert rate was achieved but several errors were detected. Although the Levenberg-Marquardt backpropagation algorithm used for teaching is highly efficient, it requires a lot of memory. It would be useful to test other less memory demanding teaching algorithms to optimize the use of the resources.

All the 41 features of the KDD dataset were used, and further investigations can reveal which elements influence significantly the output value and reduce the amount of input data to make the training more efficient and to reduce the use of the resources. Several publications focus on this topic, as the learning rate and limited use of resources are very important for the IDS system.

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Protect Peace and Security – Hungarian Law Enforcement Agencies in Peace Operations

József BODA[1]

The author's intent is to record his knowledge from 20 years of experience in law enforcement peacekeeping and crisis management, and share them with those interested in the topic.

The elaboration of the theory of law enforcement peacekeeping and civilian crises management as well as its practical implementation have not received the necessary attention in recent years, although there are more than ten thousand law enforcement officials deeply involved in this activity around the world.

The history of the participation of Hungarian law enforcement organizations in peacekeeping and crises management is quite short; in fact, we have been involved in this activity only since 1989. A few books were published covering the individual stories of law enforcement peacekeepers, but a comprehensive study of the area and a written document on practical experiences are missing.

Keywords: *civilian police, crises management, European Union, law enforcement, Organization for Security and Co-operation in Europe, police mission, United Nations*

Introduction

Without striving to cover every detail, the information the reader can find in this article will give them a general view about the participation of the Hungarian National Police (HNP) and other law enforcement organizations in international peacekeeping and advising activity, starting from the learning period in the beginning to present tasks, which are already included in the everyday work of the law enforcement organizations.

The Hungarian policing role in the international field is in accordance with the United Nations (UN) Charter, it is carried out in order to maintain international peace and security and it is in harmony with the security policy principles of Hungary.

Hungarian police experts have been taking part in international peacekeeping since 1989, based on invitations. Following the change in the political system of Hungary the demand of the UN and of other international organizations for employing and inviting the Hungarian experts to peacekeeping missions increased.

During this period the UN Civilian Police (CIVPOL) was formed, the "civilian police observer" units were applied as separate components in the UN missions. The UN introduced the division of the missions into parts. Within that split-up it separated the military and policing-security tasks.

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The first such mission, which was operated organizationally separated and had a concrete task, was the United Nations Transition Assistance Group in Namibia (UNTAG) mission, in 1989–1990.

Our real, definite policing participation in international peacekeeping is counted from that date.

I think that the participation of one Hungarian police official in the international UN working group, which was preparing the mission in Cambodia, was very flattering and we are proud of that fact. Our policing participation in the United Nations Transitional Authority in Cambodia (UNTAC) mission was a great challenge and it meant the period of learning. 129 Hungarian colleagues worked successfully in Cambodia in 1992–1993, while the maximum simultaneous number on staff reached 100 persons.

Since the "reference" work we have been permanently receiving new calls for Hungarian policing participation in UN missions.

A surprising experience of the initial period was that representatives of the West, Asia, Africa and the Far East in the mission accepted our colleagues with strong suspicions and with professional and human prejudice.

However, the work of our colleagues, which they carried out with a high level of expertise, order concentration on the tasks to be solved, and at a high level of English, created links and solved conflicts in a relatively shortly time, thus erasing these preconceptions. Today the representatives of other countries want and like to work with Hungarian policemen and women and even in some missions they definitely ask for the co-operation of our colleagues.

Our professional goodwill, positive and community-related human behavior is known and recognized in the UN/EU center and in many countries of the world.

Our experts work as UN employees in Rwanda and East Timor and as Organization for Security and Co-operation in Europe (OSCE) employees in Kosovo, and in European Union Police Mission (EUPOL) in Afghanistan. They won their job by applications, and their performance in previous peacekeeping actions were considered too.

Besides the UN missions, our joining the North Atlantic Treaty Organization (NATO) in 1999, the fulfillment of the OSCE invitations and the participation of the European Union (EU) in 2004 civilian crises management missions create new and newer challenges.

Based on NATO invitations our experts showed outstanding performance in several European countries (for instance Albania, Kosovo, Macedonia).

We successfully organized and arranged international UN courses in Budapest; the conferences and special professional training were held for law enforcement officials from the countries of the region. They received us based on UN and NATO invitations.

We have professionals of high-level expertise with proper foreign language skills to meet the different international challenges and invitations. However, one has to know that the fulfillment of the different international calls is limited by the material and financial means of the Ministry of Interior of Hungary.

Within the borders of our possibilities Hungary has and will keep endeavoring to meet the international challenges and invitations and to take our part from the international obligations of the Hungary.

Some examples of Hungarian Police Peacekeeping

United Nations Transition Assistance Group in Namibia

One of the first United Nations operations after the Cold War was the mission in Namibia. To supervise the peace process there the United Nations Transition Assistance Group in Namibia (UNTAG) was deployed. [1: 32] Hungarian Law Enforcement Organizations have been taking part in the peacekeeping activities since 1989, the date of the first real civilian policing mission of the UN. UN Secretary General Xavier Perez de Cuellar invited Hungary to send a contingent of 22 policemen to participate in the Namibia mission within the framework of (United Nations Transition Assistance Group in Namibia – UNTAG) Civilian Police. [2] As one of the basic criteria was fluency in English, checks were pursued within the ranks of the police force which yielded a rather shocking result: within the uniformed police units there were all in all 3 officers with a state language exam certificate in English. The disappointment stemming from this outcome resulted in a disinterest in joining CIVPOL. Later, based on the Hungarian experience in the International Commission of Control and Supervision (ICCS) in South Vietnam in 1973–1975, and presupposing that the tasks in Namibia will require negotiating skills, the Ministry of Foreign Affairs (MFA) and the Ministry of Interior (MoI) invited applications from their ranks for the mission. Finally, diplomats with peacekeeping experience and officers from the Interior Ministry's state security agencies were accepted together with officers from civilian police. The contingent underwent a training course at the Police College in Budapest. As Contingent Commander (CC) in the rank of police Lieutenant-Colonel, Ambassador Tamás Gáspár Gál himself was appointed, having year-long experience in ICCS, and at the time Director of the African Department of the MFA. [3: 44]

United Nations Transitional Authority in Cambodia

After the change in the political system the leaders of the Ministry of Interior and the National Police considered more active participation in peacekeeping missions a national interest, which may strongly support the reaching of our strategic aims.

This is evidenced also by the fact, that in 1992–1993 more than 100 Hungarian police experts were serving and protecting peace in remote Cambodia with UNTAC.

By the effective diplomatic mediation of the permanent members of the UN Security Council the Paris Treaty was born. In this Treaty the four political powers of Cambodia (the State of Cambodia represented by the government in Phnom Penh, the royalist FUNCINPEC led by Norodom Sihanuk, the Khmer People's National Liberation Front (KPNLF) representing the civilian powers led by Son Sann and the Khmer Rouge) made an agreement to place the country, for one year from May 1992 until May 1993, under the control and administration of the UN and to decide their political fight through democratic and free elections controlled by the world's organization.

The mission of the UN in Cambodia in 1992–1993 was one of the greatest challenges faced by the UN (over 2 billion USD) international mission, activating large human forces (around 22 thousand persons) in the early history of the UN peacekeeping. The manpower included 3600 civilian police officers from 32 countries, under the command of Dutch Police Commissioner Klaas Roos. [1: 39]

Besides the traditional peacekeeping activity the UN had to face lots of complex tasks.

In order to handle and solve these tasks the UN created 7 components:

- Civil Administration Component;
- Civil Police Component;
- Military Component;
- Component of the Elections;
- Component of Refugee Matters;
- Component of Human Rights;
- Component of Rehabilitation.

The task of the Civil Police Component was to control the local police organizations down to village level by providing professional advice and ensuring the neutral political atmosphere free from intimidation. This latter was necessary for the elections. [4]

The mission was even more sophisticated due to the fact that all the four Cambodian political powers had a controlled, geographically defined territory with own public administration and military and police forces. The action was a real challenge considering also that it had to be performed in a country having one of the most undeveloped infrastructures of the world. Permanent tension was present throughout the country as the Khmer Rouge had been sabotaging the Paris Treaty from the beginning. They were hardly, or not at all, willing to co-operate with the UN forces and they did not, or only on eventual basis, permit the international observers to enter their territory.

Knowing that they would inevitably loose the elections they did not participate and did not allow the organization of the elections in their territory. They kept the population there under permanent psychological pressure and they tried to have the mission fail by means of threat, terror actions and pogroms against Vietnamese ethnic groups.

The UN Secretariat called our country to take part in a civil police component of over 3 thousand persons by sending 100 police observers.

Our participation in the mission was a serious challenge from a Hungarian point of view too. It was a challenge also considering that after the political change in Hungary the Hungarian Police was subject to changes too, and it had to overcome all the problems concomitant of the changes. It was a question, whether under these circumstances the Hungarian Police could meet the high level international requirements suddenly required.

Maybe it is not an overstatement to say that taking into account the order of the task, the number of the participants from our side, and the sophistication of the mission the *UNTAC has been the school of the Hungarian police for international peacekeeping.*

Our police monitors gained international peacekeeping experience in large numbers in the mission in Cambodia. The Hungarian staff of the UNTAC became a sort of backbone of the contingents participating in the international policing missions later.

The UNTAC proved to be a good school for Hungarian police observers also in respect to that, besides the classic international police observer's activity connected to the profession (control of the local police organizations, advising, creating the "neutral" political atmosphere for the elections), as parts of a complex mechanism, they were able to engage in everyday co-operation with the representatives of the other six UN-components. This way they could gather experience about the operation of integrated peacekeeping.

As a general experience of the UN mission in Cambodia we can make the statement that the UN "penetrated" into the local Civil Service the deepest (to village level) through its

police component. The police observers were the ones making the most direct, everyday contact with the local inhabitants (they were living among them), being the most direct interface through which the individual, the chief of the village, the policeman, the soldier, the farmer, the refugee who had returned to his village got in contact with the UN as such.

The Hungarian police observer staff provided service spread throughout 10 regions and in the capital. Around 40% of our observers performed his activity in especially dangerous conditions from a security point of view.

There were critical zones in the country. The repeated Khmer Rouge attacks threatened the security of our compatriots working in the Middle and Northwest Cambodia, while in the Eastern part of Cambodia, next to the border of Vietnam the risk of getting malaria was high.

Our observers, who were living and working in the towns and villages of Middle and Northwest Cambodia, had to survive armed attacks in the night several times. Even now, looking back from the distance of years, one has to give special appreciation to them for their professional and human firmness. [5: 48–50]

The reliable and good performance of the Hungarian observers in the UNTAC was the basis of further international calls later.

Dutch Police Brigadier Klaas Roos Commander of the Police Component of UNTAC, Boutros Ghali UN Secretary General at that time, and Norodom Sihanuk, present monarch of Cambodia, all expressed their appreciation relating to the Hungarian participation. Many of our UNTAC observers were and are in senior positions in Hungarian public administration, participated in later UN missions and also in police units of UN Headquarters. They all proudly claim and wear the title of "Veteran of Cambodia". [6: 22–25]

United Nations Operation in Mozambique

Mozambique gained its independence on the 25th June, 1975. RENAMO (Resistência Nacional Moçambicana), supported by the Republic of South Africa and Rhodesia (Zimbabwe) started its fight against the Mozambique Liberation Front (from the Portuguese: Frente de Libertação de Moçambique – FRELIMO), the governing party immediately. The civilian war came to an end on the 2nd October, 1992, by a Peace Agreement.

The United Nations Operations in Mozambique (ONUMOZ) was established to help implement the General Peace Agreement, signed by the President of the Republic of Mozambique and the President of the Resistência Nacional Moçambicana. The mandate included facilitating the implementation of the Agreement; monitoring the ceasefire; monitoring the withdrawal of foreign forces and providing security in the transport corridors; providing technical assistance and monitoring the entire electoral process. The ONUMOZ civilian police component (CIVPOL) mandated monitoring all police activities in the country and verifying that their actions were consistent with the General Peace Agreement; they monitored respect of citizens' rights and civil liberties; provided technical support to the National Police Commission; verified that the activities of private protection and security agencies did not violate the General Peace Agreement; verified the strength and location of the government police forces and their material; and monitored and verified the process of reorganization and retraining of the quick reaction police, including its activities, weapons and equipment. In addition, CIVPOL, together with other ONUMOZ components, had to monitor the proper conduct of the electoral campaign and verify that political rights of individuals, groups and political organizations were respected. [7]

The territory of the country was almost totally undermined, the roads and the railways were in bad condition and the bridges were destroyed. The country was practically split up into three parts. In the Southern part, in the capital and in the Northern part of the country the government forces, while in the middle of the country the rebel troops were in ruling position. The ex-service soldiers were looting in gangs, and the extent of crime defied any description.

Nearly one year later, after the consolidation of the peace process, the international police unit was set up. [8: 52]

The tasks of the UN Civilian Police Component (CIVPOL):

- full control of the activity, staff, armament and equipment of the local police;
- control on maintaining human and civilian freedoms and rights;
- providing professional assistance;
- inspection of claims and notices;
- regular control of airports, ports and border checkpoints;
- preparation and protection of the census and the election;
- protection of the political events;
- providing personal protection for the leader of the opposition party (Alfonso Dhlakama) and for the leaders of the ONUMOZ;
- inspection of the crimes, accidents and offences perpetrated by UN members.

The UN Secretariat called our country to participate in the international police unit of 1000 persons by 10 police officers. In May 1994 we were asked to send another 10 police observers.

The first group of the Hungarian Contingent arrived in Maputo, capital of Mozambique on the 13th January, as the member of the UN CIVPOL, which counted 100 persons at that time.

The UN and the skilled CIVPOL played a great role in the democratic transformation of the local police as well as in its technical furnishing and in improving its working conditions. Also, the fact that the local police respected the human rights was the result of the CIVPOL' activity. [6: 25]

Multinational Forces and Observes

On the 17th September, 1978, in Washington, Anwar Sadat, president of Egypt and Menachem Begin prime minister of Israel signed the Camp David Agreement, which brought an end to the 30 year old armed conflict between Egypt and Israel. The Peace Agreement between the two countries was signed on 26th March, 1979. As per the agreement, on 25th April, 1982, Israel withdrew its troops from the territory of the Sinai Peninsula. On the very same day the organization of the Multinational Forces and Observers (MFO) started its operation. It was to monitor the execution of the security measures of the Peace Agreement and to curb the eventual infringement of the Agreement.

The Sinai Peninsula was split up into 4 zones in the Agreement and it also defined the limit of the military persons and equipment in the zones:

- Zone "A": 1 Egyptian mechanized rifle division (max. 22.000 persons);
- Zone "B": 4 Egyptian border police battalions (max. 4000 persons);
- Zone "C": MFO forces and Egyptian police unit with exclusively light armament;
- Zone "D": 4 Israeli rifle battalion (max 4000 persons).

The Sinai Peninsula is a desert-like, thinly populated (around 45,000 Arabs, out of which 30,000–35,000 people are Bedouins). The majority of the MFO observers were in service almost for the entire period of the mission in Zone "C".

The aims of the Camp David Agreement and the principles for organizing and running the mission concur with the general aims and principles of UN peacekeeping missions.

The Hungarian government, having received a request from the international organization, brought a decision on 25th May, 1995, to contribute a 41-person mixed (DM and MI) military police contingent to represent the Republic of Hungary from 1st September within the MFO mission. According to the contract, Hungary supplied the MFO with a 41-person military police unit including all necessary equipment for accomplishing the police tasks.

Beyond duties concerning the maintenance of order and discipline amongst MFO forces, this contingent's tasks also included the following:

- to assist the MFO Force Commander in the field of military police affairs;
- to jointly execute liaison tasks with the local police forces;
- to investigate crimes;
- to investigate unusual events, including vehicle accidents;
- to protect MFO property;
- to execute crime-prevention duties;
- to execute traffic control;
- to patrol;
- to execute searches. [9: 144]

Beyond the above, the Hungarian contingent has two officers within the MFO staff, one of them acting as a liaison officer and the other as a medical officer. Out of the 41 persons of the personnel, 15 come from the Ministry of Interior's National Police Command – mostly in those positions where specialist knowledge is required – the additional 24 officers come from the Hungarian Defense Force (HDF).

Taking into account the local peculiarities, the Hungarian police contingent also included four policewomen.

The last Hungarian contingent handed over the mission to the Canadian Military Police after 20 years of service in 1st April, 2015. [6: 27–28]

United Nations Mission in Bosnia Herzegovina International Police Task Force

The Peace Agreement signed at the end of 1995 had the mission to settle the fate of the civil war victims, the many hundreds of thousands dead, the several million refugees and to support democracy in the newly born countries. Following the conclusion of the Dayton Treaty, in 1995 the UN Security Council, based on the definite request of the Parties having signed the General Frame Agreement, created the UN International Police Task Force (IPTF). It received the task to provide support for the entities in the fulfillment of their constitutional obligations relating to policing.

The IPTF is headed by a Commissioner appointed by the UN Secretary General. The Commissioner acts in a close co-operation with the Special Representative of the UN Secretary General (SRSG), with the Office of the High Representative (OHR), with the Commander of the IFOR and with other high level representatives of the International Community as

well as with the highest levels of the local executing authorities. The IPTF has no traditional police authority with rights to investigate and other tasks.

The policing character is emphasized, as the activity the UN expects this organization to carry out requires high level policing and law enforcement grounding and experience.

The tasks of the International Police Task Force:

Monitors and checks the policing activities and objects including the relevant jurisdictional institutes, organizations and procedures.

- Gives advice to the policing organizations and their employees.
- Provides training for the employees of the policing organizations in order to get them to pay more attention to such fundamental elements of public security, as the return of the refugees, organized crime, drugs, corruption and terrorism, as well as public security crisis management (including handling mass demonstrations).
- The IPTF facilitates the policing activity of the Parties – within the frame of its support mission.
- Evaluates the problems threatening public order and gives advice to the policing organizations, so that they handled these threats in accordance with their possibilities.
- Gives advice to the governing authorities of Bosnia and Herzegovina relating to the organization of the effective civilian policing organization.
- Provides support for the employees of the policing organizations of the Parties by participating in the execution of their service tasks. The way of acting is determined by the IPTF. [10: 60]

The IPTF launches inspections in the cases, where a policeman or any other officer of any policing or jurisdictional organization is accused of participating in any infringement of the human rights or of the basic freedom rights. Further tasks are the reform of the border police and providing support for the organization in its fight against organized crime.

The Police of the Hungarian Republic have taken part in the work of the IPTF since 10th March, 1996 until they handed over the tasks to the very first European Union led mission in December 2002.

During the elapsed time several contingents have been sent to Bosnia–Herzegovina yearly with a total staff of more than 200 Hungarian Police Officers. Our colleagues fulfilled their tasks to the satisfaction of the UN officials at a high level of the professional expertise, and conscientiously.

United Nations Interim Administration in Kosovo

After longer or shorter bloody local wars, like in Slovenia, Croatia, Bosnia–Herzegovina an international war started between the allied NATO forces together with the UÇK (Kosovo Liberation Army or UCK) and the Yugoslavian Army in Kosovo and in Serbia as well. After the collapse of Serbian supremacy in the Kosovar region the Security Council, by its resolution 1244 (1999) of 10th June, 1999, authorized the Secretary-General, with the relevant international organizations, to establish an international presence in Kosovo, Federal Republic of Yugoslavia, in order to provide an interim administration in Kosovo under which the people of Kosovo can enjoy substantial autonomy.

After the deployment of the international security presence known as Kosovo Force (KFOR) in Kosovo on 12th June, 1999, the Yugoslav Army and the Serbian Security Forces

began their withdrawal from the province in accordance with the schedule (S/1999/682) between the Federal Republic of Yugoslavia and NATO military authorities, which was completed on 20th June, 1999.

The post-war appearance of the province, as well as the humanitarian situation was miserable. Although the level of damage suffered during the war varied markedly across the province, e.g. much of the northern towns remained virtually untouched by the hostilities; the principal problems were the energy and water supply. These and the public service structures of Kosovo were largely inoperative due to the combination of neglect, war damage and the departure of the trained staff.

United Nations Mission in Kosovo (UNMIK) immediately established a presence on the ground. Its task was unprecedented in complexity and scope. The Security Council vested UNMIK with authority over the territory and people of Kosovo, including all legislative and executive powers and administration of the judiciary. The Mission was asked to perform basic civilian administrative functions; promote the establishment of substantial autonomy and self-government in Kosovo; facilitate a political process to determine Kosovo's future status; coordinate humanitarian and disaster relief of all international agencies; support the reconstruction of key infrastructure; maintain civil law and order; promote human rights; and assure the safe and unimpeded return of all refugees and displaced persons to their homes in Kosovo.

In a first-ever operation of its kind, UNMIK initially brought together four "pillars" under United Nations leadership:

- "Pillar I": Humanitarian Assistance, led by the Office of the United Nations High Commissioner for Refugees (UNHCR);
- "Pillar II": Civil Administration, under the United Nations;
- "Pillar III": Democratization and Institution Building, led by the Organization for Security and Co-operation in Europe (OSCE);
- "Pillar IV": Reconstruction and Economic Development, managed by the European Union (EU). [11: 72]

With the emergency stage over, UNHCR's work under "Pillar I" was phased out at the end of June 2000, after the majority of the refugees, who had fled during the war, returned. "Pillar I" was henceforth responsible for rule of law functions. The Special Representative of the Secretary-General (SRSG) for Kosovo, as the most senior international civilian official in Kosovo, presided over the work of the pillars and facilitated the political process designed to determine Kosovo's future status. In the following nine years, the interim administration led by the United Nations, with the support of its key operational partners, including the EU, OSCE and United Nations agencies, funds and programs, helped Kosovo make significant strides in establishing and consolidating democratic and accountable Provisional Institutions of Self-Government and in creating the foundations for a functioning economy. However, the full reconciliation and integration of Kosovo communities remained a challenge. UNMIK international police personnel were deployed to the five Kosovar regions and consisted of officers sent by their respective mother countries to serve with the UN. Regardless of their national experience, all of them have to follow the international standards of policy, as well as the local law. Although in the earlier UN missions the UN CIVPOL conducted investigations too, mostly in the cases of capital and political crimes, its authority did not cover the full spectra. On one hand the fact that the police officers were unarmed gave little "safety", but

sometimes they faced difficulties in actions against criminals or perpetrators. Also the first Formed Police Unit with special tasks deployed by the United Nations in the United Nations Mission in Kosovo. A Formed Police Unit (FPU) is a team of 140 police officers, which is deployed as a group, who undertake crowd control, protect UN staff and material and escort UN personnel when they must visit insecure regions of a mission area.

Subsequently, following the declaration of independence by the Kosovo authorities and the entry into force of a new constitution on 15th June, 2008, the tasks of the Mission have significantly been modified to focus primarily on the promotion of security, stability and respect for human rights in Kosovo. The adoption of a Presidential Statement by the Security Council on 26th November, 2008, allowed the European Union (EULEX) to take on an increasing role in the rule of law sector and UNMIK to terminate its rule of law operations and conclude its reconfiguration by June 2009. Following its reconfiguration, UNMIK's main strategic objective has been the promotion of security, stability and respect for human rights in Kosovo through engagement with all communities in Kosovo, with the leadership in Pristina and Belgrade, and with regional and international actors, including the OSCE, EULEX and KFOR. The OSCE and EULEX have maintained their important roles within the framework of Security Council resolution 1244. UNMIK and the OSCE Mission in Kosovo exchange information on a regular basis, particularly on political and security developments. In line with the Security Council presidential statement of 26th November, 2008, and the Secretary-General's report of 24th November, 2008. EULEX operates in the rule of law sector under the overall authority and within the status-neutral framework of the United Nations. KFOR and UNMIK continue to engage in information sharing, particularly with regard to security developments, coordinate activities and developing common approaches on issues related to the maintenance of peace and stability on the ground. The United Nations agencies, funds and programs also continue to work closely with UNMIK. [12]

The Hungarian Police Contingent has been participating in the mission's work since October 1999. All together approximately 200 Hungarian law enforcement officers and civilian experts have participated in the mission so far.

United Nations Observer Mission in Georgia

The conflict in Abkhazia, strategically located on the Black Sea in the northwestern region of the Republic of Georgia, began with social unrest and the attempts by the local authorities to separate from the Republic. It escalated into a series of armed confrontations in the summer of 1992, when the Government of Georgia deployed 2000 Georgian troops in Abkhazia. The United Nations sought to revive the peace process by diplomatic means, consulting with the Conference on Security and Cooperation in Europe (CSCE) (now redesignated the Organization for Security and Cooperation in Europe [OSCE]) so as to ensure effective coordination of activities. In November 1992, a United Nations office opened in the Georgian capital of Tbilisi to provide an integrated United Nations approach in the region and to assist in the peacemaking efforts of the Secretary-General. On 24th August, 1993, the Security Council, by resolution 858 (1993), decided to establish the United Nations Observer Mission in Georgia (UNOMIG), comprising up to 88 military observers, plus minimal civilian support staff, to verify compliance with the ceasefire agreement.

Following recommendations formulated by a security assessment mission in late 2002, on improving the security situation in the Gali district, the Secretary-General recommended that a *civilian police component of 20 officers* be added to UNOMIG to contribute to creation of conditions conducive to the safe and dignified return of internally displaced persons and refugees. He also recommended extending the mandate of the Mission for another six months. Accordingly, the Security Council, by its resolution 1494 (2003) of 30th July, extended the mandate of UNOMIG until 31st January, 2004 and also endorsed the Secretary-General's recommendation to add a police component of 20 officers to the Mission. In general, the United Nations Civilian Police has monitoring and advisory functions, and in some countries plays a crucial role in strengthening capacities of local Law Enforcement Agencies and improving security conditions in conflict zones. The UNOMIG Civilian Police is set to improve the security conditions by assisting in training and equipping law enforcement agencies.

On 15th June, 2009, the Security Council failed to extend the mandate of UNOMIG after Russia vetoed a technical roll-over for the mission. UNOMIG, thus, ceased to exist at midnight on the same day. "The Secretary-General regrets that the Security Council has been unable to reach agreement on the basis of a package of practical and realistic proposals he submitted to the Security Council aimed at contributing to a stabilization of the situation on the ground", Secretary-General Ban Ki-moon said in a statement issued by his spokesperson. [13]

In UNOMIG between 2003–2006, three Hungarian Police officers served as CIVPOL observers including the Senior Police Advisor position from October 2004 to March 2006. [14: 76–79]

Organization for Security and Co-operation in Europe Mission in Kosovo

The OSCE has strengthened its police-related activities to improve the protection of participating States from risks and challenges posed by trans-national and organized crime, by trafficking in drugs, arms and human beings, failure to uphold the rule of law and by human rights violations The organization has police advisers and police assistance programs in several missions. Activities include police education and training, community policing and administrative and structural reforms.

Policing Activities

OSCE police operations are an integral part of the Organization's efforts in conflict prevention and post-conflict rehabilitation.

The Organization for Security and Co-operation in Europe participated in the normalization of the situation in Kosovo. The task of OSCE, which is considered as the third pillar in the Kosovo mission of the UN, to build the democratic institutional system and within that to create the foundations of a special policing service.

The Kosovo Police Service (KPS) was built on democratic principles and it can be described as a community police model, a special organization, which through its members represents the divided society and consists of the representatives of the different ethnic groups. The basic task of KPS is to make the entire society trust in the police work, which is based on the international principles of the human rights.

This is the task in which the Hungarian policing experts have participated since summer 2000. During the past years the growing number shows on one hand the recognition of the work done so far, and the interest of the colleagues in this special and challenging service.

The Police Academy directed by OSCE is located in Vushtr/Vucitr 25 km away to the north from the capital, Pristina. It is near Mitrovica, which is the best known town in Kosovo. The staff of the Academy consisted of international instructors, local suppliers and Kosovar lawyers.

The first students started their studies in September 1999. The training mandate of the Academy mainly covered police training, on a democratic bases, and this included the basic training of around 4000 policemen. The training was carried out at several levels. The most important was basic training, lasting for 27 weeks, which means many thousand lessons. The basic training period within the Academy was 12 weeks. After the expiry of this period the students were transferred to their service district and they started to work under the supervision of mentors, UN policemen. During this period they frequently returned to the Academy, or to the training centers located in the region centers. Here they received so-called field training and special training, like criminal expertise, driving and traffic site inspection, for instance. [15: 18]

In the year 2000, ten Hungarian police experts worked in this international environment. They worked as the representatives of the Hungarian Government (secondment) having certain contract conditions with OSCE. The colleagues were selected in the Vienna Center of the OSCE based on the CVs and applications sent there by the Hungarian Foreign Ministry. The conditions: at least 8 years experience in policing, adequate health condition, previous mission experiences (preferably in the Balkan), good command of English, and teacher, instructor, or mentor skills. [6: 41]

European Union Crises Management Missions

The idea of a common defense policy for Europe dates back to 1948 when the UK, France, and the Benelux signed the Treaty of Brussels. The agreement included a mutual defense clause, laying down the foundations for the creation of the Western European Union (WEU), which remained until the late 1990s, together with NATO, the principal forum for consultation and dialogue on security and defense in Europe.

Call for contributions in 2001, resulted in Ministerial Commitment Conference: target met – 5000 police officers pledged. Rapid deployment capability (RDC): 1800 officers, 13 rapidly deployable Integrated Police Units (IPU) and FPU of 70 to 110 officers each, 2 Rapidly Deployable Framework Headquarters in non-stabilized situations, in particular for substitution tasks, may be put under temporary military command.

The European Gendarmerie Force was established outside the *European Security and* Defense *Policy* (ESDP), but may offer capabilities to EU for specific operations, with an initial force of 800 personnel.

Since the creation in March 2002 of the European Union Police Mission in Bosnia and Herzegovina by Council Joint Action, some 30 civilian and military missions and operations have been launched under the Common Security and Defense Policy (CSDP). The EU is constantly improving its crisis management capabilities. Headline Goals, both civilian well as military, have been defined and adapted to match the changing security environment.

The CSDP was on the agenda of the December 2013 European Council meeting, when the heads of states discussed how to enhance defense capabilities, strengthen the defense industry and improve the effectiveness, visibility and impact of the CSDP.

Hungarian Law Enforcement Officers in European Union Crises Management Missions

The EU has an ideal peace concept based on democracy and economic development, but as a regional organization it is not possible for the EU to keep away from the international crises, because the changes and processes in the World influence the security of Europe and effect its economical and political stability. During the EU Civilian Capabilities Commitment Conference in 2001 Hungary offered 107 police officers for the EU Civilian Crises Management Contingent. [16: 10]

The EU has a priority to guarantee peace and security in Europe, but the member states in 2003, approved the European Security Strategy which was to give the EU global tasks in the field of international security. That is why EU, as a financial and economical center, must make every effort to assist international crisis resolution.

The MoI International Training Center was tasked to provide training for the Hungarian Civilian Crises Management Contingent during the years of 2002 and 2003. As a candidate country Hungary deployed 5 police experts to the first EU Police Mission in Bosnia–Herzegovina (EUPM) in 2003. Since 2004, the HNP participated in more than ten EU missions (EUPM; European Union Force [EUFOR] Althea; European Union Police Mission [EUPOL] in the former Yugoslav Republic of Macedonia [Proxima]; EUPAT; EUPOL Afghanistan; European Union Monitoring Mission [EUMM] Georgia; European Union Integrated Rule of Law Mission for Iraq [EUJUST Lex]; EU Co-ordinating Office for Palestinian Police Support [EUPOL COPPS]; European Union Border Assistance Mission at the Rafah Crossing Point [EUBAM Rafah]; European Union Rule of Law Mission in Kosovo [EULEX Kosovo]; European Union Border Assistance Mission to Moldova and Ukraine [EUBAM Moldova-Ukraine]; European Union Advisory Mission [EUAM] Ukraine) from 2005 till the end of 2015) with more than 500 police and judicial experts.

Conclusions

Thanks to the outstanding performance shown, Hungary has been continuously participating in the solution to the different conflict-situations throughout the world, mainly in Europe, but also in Africa and Asia.

During the nearly three decades that have elapsed, more than 1000 police officers and other law enforcement experts carried out peacekeeping and civilian crises management activities in fifteen countries and three continents of the world.

Our commissioned officers and non-commissioned officers did their best in four types of the policing-peacekeeping activity: observing, advising, executive police works and military police service.

Their performance is characterized by the fact that over 30% of the staff received commanding and staff-officer duties. In all the peacekeeping operations the representatives of our country were present in the general leading staffs. In several cases they served as region

and county superintendents (Bosnia and Herzegovina, Cambodia, Georgia, Iraq, Kosovo, Mozambique, Ukraine, etc.).

In many operations we tightly co-operated with the military observers and with the basic peacekeeping units of the Hungarian Defense Forces (Angola, Bosnia and Herzegovina, Egypt, Mozambique, Kosovo, West Sahara) and Hungary continues to support other nation's activities nowadays too.

The Human Resources Department of the Ministry of Interior carries out the directive and co-ordination tasks at ministry level, whilst the tasks of preparation, training and further education belong to the Training Division of the National Police Headquarters.

The Economic Supply Directorate of the National Police Headquarters deals with the questions of the supply, equipment, and reserves.

Thanks to the thorough preparation, the excellent equipment and the leaders' care, the Republic of Hungary has had no casualties during the completion of the policing-peacekeeping tasks until now, though, some injuries and more serious sicknesses occurred.

Joining the European Union, in 2004, brought the active participation in the civilian crises management activity of the Union. The bases for that exists owing to the successive operations of the last years.

During the last decades the nature of conflicts in all the continents have changed; thus, the tasks and characters of peace operations also have to change. The fundamental changes of peacekeeping and peace building created a completely different situation for law enforcement peacekeepers. Factually, it is a fundamental rule that there are no two identical conflicts. If we do not understand the essence of the conflict at all levels of the timely situation we cannot achieve good results in peace operations.

To carry out law enforcement duties during peace operations is very expensive and time consuming, but a well-prepared personnel, and adequate budget for the different methods will grant the expected good results, which will be cost effective and proportionate to the invested effort.

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