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The effect of specific environmental features on the activities of the Hungarian Defence Forces in Afghanistan[1]

LIPPAI Péter[2], PADÁNYI József[3]

The environment — primarily the weather and the terrain — always has consid- erable impact on the success of military operations. We have numerous examples in military history when the extreme environment and the hostile weather rendered the implementation of the military leader's plans difficult or even prevented them. These days when the consequences of climate change play an increasing role in our everyday lives we have to pay special attention to the utilization of the experience gained in our missions. The soldiers of the Hungarian Defence Forces are among the first to meet climatic extremities, considerable temperature fluctuations and diseases unknown so far. This attention is made even more important by the fact that our presence extends from Africa to Asia, thus facing extreme circumstances is inevitable. Concurrently we also have to prepare ourselves for the extremely warm or cold weather in our own country. Both the preparation of our soldiers, their clothing and assets, and our operational procedures have to be thought over. This is the only way to enable our soldiers to concentrate solely on their duties thereby increasing their efficiency and safety. We will review below the practical experi- ence gained by our soldiers in the operations in Afghanistan.

Introduction

The participation of Hungarian soldiers in missions abroad – and the collection of relevant ex- perience – started at the end of the 19th century. The six European powers (Great Britain, France, Germany, Russia, Italy and the Austro–Hungarian Monarchy) jointly "sorted out" the situation in Crete (1897), China (1900–1914), Macedonia (1903–1909), and Albania (1913–1914).

The IFOR/SFOR operations predicted the difficulties the character of the terrain rep- resents. The geographic structure of the terrain, roads impassable during winter, inaccessi- ble transmission stations, routing of mountain roads, frequent and considerable water level fluctuations, the impact of high–altitude solar radiation are all factors influencing movement and the execution of tasks. We have lost public roads, military bridges and pedestrian bridg- es because of the rise of the water level. In order to enable access to radio stations that are important from a military aspect we have detached de–icing and snow removal machinery groups for the winter period. We have prepared detailed and constantly up–to–date route

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2 lippaip@gmail.com
3 padanyi.jozsef@uni-nke.hu

plans to enable long trailers to turn around the bends of mountain roads. We have increased repair capacity so that the technical equipment intensely employed in the mountains is al- ways available. We continuously modernized clothing to suit increased stress.

The Hungarian Defence Forces faced the challenges of a natural environment drastically differently from their domestic one during the 2004 mission in Iraq. As a result of consider- able temperature fluctuations, desert climate, dust and direct sunlight, effects emerged that had been unknown before. These circumstances put stress both on the soldiers and the tech- nical equipment.

Missions in Africa also represented extremely serious challenges. Our soldiers have kept on participating in (primarily UN) missions on the continent for decades therefore the related challenges, among others the issue of clothing, are not unknown.[4]

We have to face similar challenges also in Afghanistan. Because of the terrain and the extreme weather conditions, substantially different from that of the domestic conditions, par- ticular attention must be paid to these effects. In particular in the light of the fact that in many cases these effects emerge simultaneously, and are mutually reinforcing.

Mission in Afghanistan

The area of Afghanistan is 647 500 km^2 with a population of approximately 29 million. It has continental borders only and its geography is basically determined by the Hindu Kush moun- tain range, dominating two–thirds of the country's

territory. From the point of view of terrain the country can be divided into three parts: Central Highlands, Northern Flatland and South- west Basin. The lunar–like, on average 3–5000 m high ridges of the Hindu Kush spreading from west to east seem terrifying for soldiers used to the Hungarian landscape. The average height of the country is 1200 m above sea level, but there are several peaks exceeding 7000 m in the Wakhan Corridor, in the direct vicinity of the Himalayas. The highest peak of Af- ghanistan is also located here: Nowshak, 7485 m above sea level. Due to the character of the terrain and the accompanying climate the high–lying regions are practically uninhabited. The mountains are passable only through mountain passes, the majority of which are unusable in winter. In winter the Salang Pass (3363 m — on the southern border of the area the Hungar- ian PRT is responsible for) can be crossed only by applying technical forces. Because of the frequent avalanches. (Hajdú, 2005: 42–45)

Climatic conditions

At the garrison[5] of the Provincial Reconstruction Team (PRT) of the Hungarian Defence Forces (MH) the climate significantly differs from the Hungarian conditions, most of the year. The city lies north of the Hindu Kush ridge, at the entrance of the north–south valley of the Kunduz River. The valley is relatively narrow up to the city and then turns into a basin with a width of several tens of kilometres. The city is located at 800 m above sea level. The

4 "In Western Sahara it caused trouble that the soldiers were provided with the old 65M boots in spite of the fact that the new desert boots had already been deployed in the defence forces. Several reports and complaints were required until they also received the new, more comfortable boots that adapted better to local weather." (Besenyő, 2010:144)

5 Pol–e Khomri, in Baghlan provinz

predominant so–called subtropical steppe climate is characterised by a hot and dry summer and a winter that is somewhat milder than the winter in Hungary. At the same time the win- ter is colder than an average winter at that latitude. By virtue of their duties the patrols of the PRT frequently visit high–altitude or desert surroundings that are characterized by more extreme weather conditions. In such environments we always have to pay attention to the acclimatization needs of people used to the European climate. The time required for a given person to reach his original physical and mental capabilities may exceed a week.

The major difference is air humidity which is decisive in one's temperature sensation. The annual and daily temperature fluctuation is also considerable; it may reach or even exceed 20 C°. The maximum daily temperature between May and October is almost continuously above 30 ˚C while the level of precipitation is negligible. In the summer period the maxi- mum temperature frequently exceeds 40 ˚C but because of the low humidity it does not feel unbearable. The number of annual sunny hours is extraordinarily high and solar radiation is excessive. Because of the harmful effects of high temperature and strong solar radiation increased attention must be paid to the time spent outdoors, which should be as short as pos- sibly required. (MH ÖHP, 2009: 90)

It is an important safety requirement to have clothing and a personal outfit that suits the weather, provides protection in every respect, is comfortable and provides sufficient "free- dom of movement". If the soldier's sense of comfort is inappropriate, his ability to concen- trate inevitably reduces and he cannot focus his attention on his duties.[6] This could prove fatal under the safety circumstances of Afghanistan.

The soldiers' temperature sensation is fundamentally influenced by clothing with proper thermal insulation.[7] Thermal comfort has high priority during military service; however, the temperature sensation of the soldiers is not in direct relationship with air temperature. The following can be listed among determining factors: personal (health, psychological and so- ciological) factors, air temperature, movement of the air, relative humidity (sweating), cloth- ing with thermal insulation and the level of physical activities. The physiology of clothing has special importance for soldiers, as clothing is the most confined environment where they live. The goal of designing clothing is to ensure the well–being of soldiers. Well–being and efficiency depend on the climatic conditions of the environment and the microclimate provid- ed by clothing. The most important physiological function of clothing as a whole is to help keep the temperature of the human body at a relatively constant level so that the daily fluctu- ation of temperature does not exceed 0.7–1.5 °C. The state of thermal comfort can be defined as a condition of mind that reflects the satisfaction with the temperature of the environment. According to another definition, which can be linked to the flow of energy in the body, the state of comfort means contentment which is possible to achieve when the heat flux to and from the human body is balanced.

The military clothing worn in Afghanistan in winter is thicker while the summer clothing is more airy, made of thinner fabric. This makes adaptation easier and it is also of help if it is available in sufficient volume so it can be changed every day. The fact that the laundry

6 One of the reasons why the units of 2nd Hungarian Army suffered heavy losses during the winter military operations at the Don River during WWII was that the provision of clothing barely functioned. In the extreme cold it resulted in the gradual deterioration of the soldiers' physical condition and thus their effectiveness in war.

7 "Thermal comfort is the condition of mind that expresses satisfaction with the thermal environment." (ASHRAE Standard, 55, 81)

system runs smoothly improves comfort and also plays a role in health conditions. At the same time frequent washing due to climatic circumstances attacks the fabric in a few months, mainly along the seams and surfaces subject to increased wear.

There is a certain contradiction between extreme heat and the requirement to protect the entire body as much as possible. Among other reasons rolling up the sleeve of the jacket is not practical because in combat situations (the possibility of which persists continuously) the stony ground may cause serious cuticle damage which — due to the hygienic conditions discussed later — could become infected. Because of the excessive sunlight it is important to wear sunglasses with an appropriate UV grade or protective goggles, especially in snowy sur- roundings. However, attention must be paid when wearing sunglasses among locals. Accord- ing to local custom, the lack of clear eye contact during communication may cause trouble. Uncovered skin surfaces — face, ears, neck, lips, etc. — should be smeared with lip care and with super high–factor sun cream. This preventive action is especially important in winter and early spring when going to snow covered but sunny areas. Under these circumstances, the strong UV radiation is not apparent because of the low temperature.

Climatic conditions have an effect on the operation of technical equipment also. Because of the high temperature, overheating occurs more easily during the operation of vehicles, it can be prevented by the proper application of cooling equipment and by increased technical inspections during breaks between marches, and before and after employment. The perfor- mance of engines reduces at higher temperatures, while extremely low temperatures may cause lubrication problems. Precision weapons with precise joints may break down easily in very cold weather. Air humidity and temperature has an impact on the adjustment of sharp- shooter weapons.

It is practical to keep vehicles in covered sheds or at least they should be protected from direct sunlight with canvas. Shaded places must be sought (if possible) when stopping if the security conditions permit it. Electronic controls are very sensitive to high temperatures also. Direct solar radiation and high temperatures have an increased effect on rubber parts and seals. Therefore, these must be replaced more frequently than usual, and require more attention during routine maintenance.

Dust wears out not only the human body but also technical equipment. Much higher wear of moving and rotating parts than under domestic conditions must be considered. Electronic devices are especially sensitive to dust contamination which requires the regular and frequent cleaning of the devices at least by mechanical dust removal such as blowing it out with an air compressor or cleaning it with a brush. This also applies to weapons. Turret guns in par- ticular may get soiled while marching therefore special attention is required. During planned breaks, besides continuously maintaining close cover, weapons have to be quickly cleaned at least where they are most prone to get soiled. After executing a mission this represents the main purpose of weapon maintenance (in dry periods) and not the prevention of corrosion. (Air humidity is practically zero.) In case of applying gun oil it must be completely removed because it forms oil mud when mixed with dust.

The environmental conditions in Afghanistan pose specific risks to the operation of air- craft as well. Heat, extreme altitude, bad visibility during landing due to dust and the abnor- mally poor light conditions require increased attention. Under normal security circumstances night missions are rare because several helicopters and cargo planes have been lost during such missions. However, increased security circumstances require that air transport and air

support duties be performed under night time conditions also.[8] Aircraft should be continuous- ly shaded, thereby reducing the direct effect of sunlight and the extremely high temperature. It is general experience that flying is a must even under extreme temperature conditions but the crew must be prepared for it in a versatile manner (clothing, liquid consumption, etc.). (Kohut et al., 2010: 61)

Climatic factors and the time difference between Hungary and Afghanistan (2.5 hours in summer, 3.5 hours in winter) require that the human body be acclimatized before exerting con- siderable physical effort. Depending on the physical condition this period may last from a few days to one week which must not be left out of consideration, neither during changing deploy- ment, nor when returning from holidays. During a mission, often lasting more than 10 hours, regular rehydration and rest must be ensured by the commanders. This aspect is crucial be- cause of the continuous danger and a traffic culture completely dissimilar from the European.

Under the climatic conditions that put a lot of stress on the body of Europeans it is very important that the staff get a good rest under conditions as comfortable as possible after the day's stress, to enable the body to regenerate. The missions requiring close attention and concentration demand this. The daily regeneration of the body is of utmost importance, for which, preferably, all required conditions must be provided. If regeneration fails to take place it has serious psychic and physical consequences on the body under unfamiliar climatic con- ditions which again increase security risks.

Daily washing, the possibility of taking a shower, and air–conditioned quarters (heated in the winter) indirectly serve the purpose of maintaining the morale of the forces. These activities considered as routine under domestic conditions are very important also in pre- venting infections. During lengthy missions, — especially those lasting for several days — it is practical to use wet wipes for cleaning oneself. This does not only serve the purpose of refreshing but it also cleans skin surface sensitive to incidental infections and removes dust. The unprofessional use of air conditioners installed in quarters and vehicles may have harmful effects arising from the big temperature difference

and may even cause pneumonia. Maintenance and disinfecting of air conditioners should be performed more frequently than at home. The use of air–conditioning and the difficult conditions of the terrain can jointly overload the engine, especially with older vehicle types where the air–conditioning was in- stalled subsequently.

For rehydration, it is preferable that water be consumed. It is worth supplementing the re- quired salts, vitamins and trace elements by Normolyt powder added to the water. 6–10 litres of liquid must be consumed during the summer period and at least 3–5 litres in the winter. It is advisable to drink smaller volumes but several times; this goal is perfectly served by the back fluid tanks (Camelback). On the other hand increased attention must be paid to regular disinfection because of the bad public health circumstances. It is very useful to put cooling boxes in the vehicles where the stored liquid stays cold and enjoyable even in the second half of the day. In order to prepare for unexpected situations water reserves lasting for an at least a 48–hour period should always be stored in the vehicles, for the entire crew.

Experience shows, that for bottled water, the half–litre packaging is practical and safe. This is the quantity an average person can consume in "one gulp". The content of the opened bottles must be consumed within half an hour because after that period harmful biological

8 One of the most efficient methods of eliminating the Afghan resistance had been lifting operations executed by the Special Forces using air transport.

processes may commence. For similar reasons the bottled water inventory must be stored protected from direct sunlight and preferably in a cool place. We should never forget that the main source of infections in Afghanistan is water.

Alcohol consumption is always a sensitive issue in operational areas. This is the same in Afghanistan, too, where alcohol has an increased physiological effect at high temperatures (blood pressure increase, diuretic effect, nervous depression, dehydration, tiredness, etc.) not to mention the question of security. The excessive consumption of coffee is not recom- mended either. The natural consequence of considerable rehydration is urination. At the same time circumstances often do not allow the convoys to stop on the way and for the soldiers to relieve themselves. Thus interim measures may occur between planned rests, such as PET bottles used as "bedpans", closable buckets or diapers for adults (although the latter is not part of the standard equipment of Hungarian soldiers, yet).

Besides the staff and the technical equipment we have to think of the dogs helping our duties. The shading, cooling and regular cleaning of the kennel, as well as the shading of open–air rest areas and the continuous provision of refreshment and drinking water serve the purpose of protecting it from high temperatures and excessive sunlight.

The precipitation, on average less than 400 mm during the year falls in different forms mainly between the end of October and May. The rainiest months are March and April. Plants quickly burn out in May in the absence of precipitation and irrigation. Precipitation in the high–altitude regions could be two to three times more. Severe thunderstorms can produce large amounts of precipitation in a very short time. In high–altitude regions snowfall gener- ally starts as early as in October, and the several meter deep snow layer recedes to the snow line in May only. Snow falls may occur at the Salang Pass, at an altitude of almost 3500 m, even in the summer. In the winter and early spring period snow avalanches must regularly be taken into account, while during the spring thaw destructive floods and mudslides might close key roads. In the area of the Hungarian camp the winter temperature is not extremely cold and daytime temperature rarely falls below the freezing–point; however, in the mountain settlements lying at higher altitudes temperatures below -20 ˚C are not infrequent. Snow is not common in the neighbourhood of the camp even in winter; snowfall is rare and not in large volumes. (MH ÖHP, 2009: 91)

It must be taken into account when planning missions and selecting clothing that when the weather is mild at the base, extreme weather conditions await the soldiers in the moun- tains or in the desert a few tens of kilometres away.[9] In winter this can be snow and snowdrift, frost, avalanche, while in the spring flood, landslide or mudslide. In areas below 2000 m fog is not frequent even in winter because of the low humidity. In the winter period mountains rarely creep out from behind the clouds which could greatly reduce travelling speed and the range of vision. Naturally air support is not possible under such circumstances.

The wind is generally not strong in lower areas. Exceptions are the periods of thunder- storms and the mountain–valley motion of air caused by the cold air suddenly coming down from the mountains along the valleys. The relatively slight motion of air can still pick up fine

9 With inappropriate clothing we risk the success of military operations. A battalion of the U.S. Defence Forces experienced that when they had been deployed in planned operations under good weather conditions in the Korean War. The cold front that arrived during the night brought a chill that 75% of the soldiers, wearing summer clothing, suffered frostbite at the temperature below freezing–point. FM 34–81–1 Battlefield Weather Effects Chapter 1. Source: http://www.globalsecurity.org/intell/library/policy/army/fm/34-81-1/ch1.htm (downloaded: 23 02 2013)

sand and dust, increasing the concentration of the particulate matter, frequently realized in the form of "dust storm".

The dust in Afghanistan contains a significant amount of dry human and animal faeces residue, especially in inhabited regions, due to a lack of covered sewage systems and sewage treatment plants. When this material gets into the air it increases the possibility of infectious sicknesses. Even when wearing anti–dust goggles inflammation of the eye occurs frequently because of dust getting into the eyes. At the same time the protection of the respiratory tracts is also useful. It is not a coincidence that finely woven cotton scarves are essential parts even of the clothing of men. Although a

net scarf is part of the Hungarian soldiers' equipment it is entirely unfit for filtering out fine dust from the inhaled air when rolled in front of the nose and mouth. This might be the reason why the system handles flexibly the "offence" of all soldiers wearing scarves with a checked pattern, purchased domestically, with the uniform when leav- ing for a mission.[10] Although officially provided anti–dust masks ensure perfect filtering but wearing and maintaining them — especially in summer — is less practical than that of the cotton scarves.

In dust storm areas one has to be prepared for all communication channels breaking down until the storm is over. In such cases air support as well as fire and combat control becomes more difficult as modern technology is ineffective. This phenomenon may cause disturbances in the operation of aircraft. From a tactical aspect dust storms are favourable to resistance fighters with a better local knowledge which they have exploited several times.

Effects of terrain, plant and hydrography

The terrain of Afghanistan is extremely diverse. In spite of the deserts in the northern and southern parts of the country the already mentioned high–altitude character fundamentally determines the landscape. Overland traffic on the highly structured terrain is focused on roads and mountain passes developed historically in certain valleys. For this reason particular emphasis must be laid on the selection and reconnaissance of routes when planning different missions. Road transport is cumbersome enough under normal conditions already because travelling speed is low due to the obsolete road system.

Because of the extreme terrain conditions and weather conditions that may easily become extreme air transport is also restricted. There aren't that many airfields suitable for fixed wing aircraft. The application of helicopters is considerably hindered by the weather that changes quickly between the high mountains and is therefore difficult to judge, and because of the high altitude above sea level. The difficulties of reserves and supply may restrict the size and efficiency of military units to be supplied.

It is decisive to maintain freedom of movement also during land operations. For this pur- pose route reconnaissance patrols have to be arranged — independently or in co–operation with the local security forces. The reconnaissance patrolling has to be repeated periodically. The reason for that lies in the experience in Afghanistan. The analysis of present and previ- ous conflicts shows that either because of violent intervention or as a result of natural forces the passability of roads may change radically. The reports of road reconnaissance patrols (road books) represent an irreplaceable source of information but they should not be accept-

10 The German Bundeswehr equips its soldiers with local looking but domestically produced, uniform design cotton scarves, as part of their equipment.

ed uncritically. All the more so because the military history of the country includes several occasions when "foreigners" suffered losses when they were leaving their target on the same route on which they approached it.

The insufficiently developed traffic infrastructure and the corridors of movement restrict- ed by the terrain can be watched unnoticed relatively simply and continuously. Therefore the local sympathizers of the resistance fighters can alert their companions in the endangered zone in due time, who then frequently attack, with explosives or by ambush, shooting at convoys heading back home on the same route. If the goal is to block the "inward" convoy the attack may take place on the route leading towards the target area. On a terrain providing good opportunities for concealed and unexpected assaults resistance fighters with appropriate local knowledge select the locations superbly. For this reason efforts should be made that our own troops return from a given target area on a route other than the one they approached by. It is easy to get trapped in the narrow valleys and there is no way out from there.

The mountainous region is not ideal for conducting combined arms operations and the ap- plication of motorized formations. The majority of roads are narrow and make only one–way traffic possible, while civilian traffic must continuously be taken into consideration. Steep hairpin bends do not permit the movement of lengthy vehicle combinations even in case of more modern routes. The speed, manoeuvring ability and firepower of motorized forces can- not be best utilized on this highly difficult terrain.

Soviet troops that used to fight here earlier gained bitter experience about the most suit- able methods and systems of ways, from the point of efficiency. It turned out that for fighting against rebels air transport operations are efficient tools because these reduce the response opportunities for guerrillas. (Zicherman, 2005: 173) Allied forces try to make this even more efficient by utilizing their considerable technological advantage in night warfare and they fre- quently carry out air transport lifting operations during the night. (Zicherman, 2006: 52–56) The geographical circumstances of Afghanistan make the use of communication equip- ment more difficult. Sometimes even communication within the column on route causes difficulties in the long, narrow, winding and deep valleys. In general it can be stated that communication equipment should be set to a higher performance than usually. Tactical VHF radios can be applied only in a very limited way between troops on mission and the situation rooms controlling them. The application of short–wave devices also requires close atten- tion and serious planning. In case of convoys in motion even the most up–to–date satellite communication devices cannot operate continuously and be completely reliably under these topographical features. It seems satellite data communication systems are relatively the most reliable communication channels. In order to maintain continuous connection 3–4 communi- cation channels of different "bases" should be applied and as an

interim measure one has to prepare to use mobile phones, while observing the rules of undercover communication. However, the high ore content of the mountains can cause unpleasant surprises in spite of the most careful preparations and the use of temporary relay stations. Occasionally there is no solution to overcome permanent and provisional “communication black holes”. It is advisable to prepare a sketch of these communication anomalies on the map and update it continuously.[11]

11 We had to take this problem into account in Bosnia–Herzegovina, as well. On the structured terrain – especially in the early period of the IFOR/SFOR operations between 1995 and 1999 — the maintenance of continuous communication between the convoys and the camp caused serious difficulties. The situation has changed by today thanks to the restoration of civilian communication systems.

The steeper and higher mountainsides are naked and rocky, and the majority of the roads are not paved. The stony ground wears down the surface of the tyres quickly, and the tyre also wears faster on the hot asphalt. Brake pads are exposed to higher stress because of the terrain and they have to be replaced more frequently. Appropriate logistical preparations have to be made to fulfil the increased spare part requirement.

The driver crew can prepare for the terrain conditions in Afghanistan only to a limited extent under domestic circumstances. Therefore it is essential that drivers are given the op- portunity to get used to the particular terrain conditions after arriving at the operational area. When doing so the staff must learn the rules of activities under undesirable natural phenome- na (snow and mud avalanche, earthquake, landslide, sudden floods, etc.). It is very important to use the engine brake when going downhill as much as possible instead of the normal brake. The efficiency of it depends on the model, and in case of heavyweight armoured equipment pauses should be inserted even in the driving style required in the mountains; otherwise brakes might get seriously damaged.[12]

The steep, long rises and the lower oxygen content at high altitudes put excess load on the vehicle engine and their performance decreases. Overheating must be avoided if pos- sible. The proper application of ventilation equipment and the optimal selection of engine performance can help to achieve that. Therefore when covering long distances breaks should be taken at (safe) locations designated in advance for this purpose. Vehicles should not be utilized to their maximum transport capacity and their equipment boosting off–road capa- bilities should occasionally be tested. At the same time this provides an opportunity to be refreshed on the rules of their use. In addition to installed equipment all vehicles should be furnished with earthwork tools and emergency tools that assist movement. Spare wheels carefully prepared for use and towbars should be standard equipment on vehicles (a towrope is not sufficient because of the mountainous terrain). Technical rescue vehicles and tractors have a lot more duties under these circumstances than at home. Because of sudden technical breakdowns and the increased fuel consumption sufficient volumes of fuel should always be carried by the convoy.

The poor security situation (possibility of attacks), poor road conditions, extreme incli- nation angles, slopes and rises require that all objects in the vehicle are reliably fastened, because they could cause serious injuries when they break away. The vehicle may roll over therefore all soldiers must undergo rollover training during the preparation period.[13]

The high–altitude environment influences the physical performance of people. The main reason for that is the lower oxygen content of the air. As the majority of our soldiers are not used to it and their loadability reduces considerable. The heavy personal outfit further impairs the staff’s physical performance and reduces the resistance of the body to infections (due to fatigue).

Such factors have greater and bigger impact on military operations than under domestic circumstances because of the underdeveloped infrastructure and extremely diverse ter- rain. Moreover, the weather forecasts concerning the given area are more inaccurate which makes preliminary planning difficult. In this situation increased cautiousness, the evalu-

12 For this purpose the Soviet troops built “resting bays” in suitable locations along the main supply routes.

13 Based on the narration of the physicians working in the ISAF ROLE–3 hospital in Mazar–e–Sharif a considerable portion of the injuries suffered in Afghanistan are caused by objects breaking away in the vehicles during combat actions.

ation of fresh, comprehensive reconnaissance information as well as the proper prepara- tion and installation of military equipment can be a solution. The significance of different equipment assisting movement (winch, power take–off, bridge elements etc.) and acces- sories increases.

Based on their centuries–old experience resistance fighters realized that attacks from “above” are not only more effective (especially in case of anti–tank arms) but – because of the restricted altitude abilities of the weapons of those defending themselves – it reduces the possibility of counterattacks. In order to eliminate this Hungarian troops have installed smaller calibre (7.62 mm PKM) machine guns (able to shoot to a higher altitude) in addition to the 12.7 mm armament in the turrets of armoured vehicles, and the turret shooter also installed his machine rifle in the turret with which he can easily and quickly respond in case of an attack. If necessary he was able to shoot with the PKM machine gun (with manually controlled fire) at a steep angle.

Preliminary reconnaissance and assessment of the terrain was a basic goal when wide- ly applying the SUAV

(Small Unmanned Air Vehicle) by the Hungarian PRT. The highly structured terrain may restrict the "field of vision" of the device on the one hand, and on the other hand the existence of the "optical" contact between the control unit and the flying de- vice must be monitored, because it has an effect on its range. By the proper selection of the location of the control unit — for instance on a predominant height — the range can be fully utilized by selecting the proper flying altitude.

Vegetation also has an effect on military operations. In Afghanistan vegetation starts in the end of March or in April which mostly means the rich grass appearing on mountainsides, as trees start to put out buds only later. As a result of the civil war lasting for decades and the uncontrolled harvesting of wood forests are hardly seen, and only 0.5–1% of the country is covered by forests. In the absence of forestation the existing trees are young and weak, they often look like bushes or shrubs. Undemanding sumac and olive trees have spread mostly. All kinds of fruit tree plantations can be found along the rivers. Sumac forms impenetrable hedges at many places along the roads and channels. Until the shedding of their leaves in November these hedgerows, together with the mud walls typical also for agricultural regions provide favourable conditions for executing an ambush. At higher altitudes sparse hedges can be seen. (MH ÖHP, 2009: 88)

Agricultural production flourishes in the valleys of rivers, although — looking through European eyes — cultivation is performed with medieval methods. The dense channel system ensnaring the valleys and serving agricultural purposes seriously hinders military movements which are emphasized by the fact that bridges are not frequent either. As ditches and channels are not always indicated even on the most accurate maps some safety can be obtained through accurate and farsighted planning and continuous reconnaissance. One of the most important foods in the country is rice and the flooded producing areas represent unpredictable obstacles in the growing period for those less familiar with the given neighbourhood.

Due to the thin vegetation the huge amounts of water flow into the valleys during spring showers and snow melting washes off arable land from the rocks. Soil erosion cuts spectac- ular wounds in the landscape and the resulting mudslides represent serious danger for those living in the bottom section of valleys and at the feet of mountains. These phenomena may easily catch unawares soldiers performing some activity there. The clayey mud occasionally deposits on the roads in thicknesses of several meters and can bring road traffic to a standstill

for days. For this reason particular attention should be paid to weather reports before leaving for a mission and alternative routes must be designated.

The water flow of rivers and streams is very extreme. While water–level is low in the dry season, it can be extremely high in rainy periods, especially during the melting of the snow. Floods that are common and sudden in these periods bring about enormous devastation. In case of otherwise shallow mountain streams and rivers the water overflows its banks and overwhelming floods can develop from one hour to the next, filling the entire valley. These make traffic on valley roads impossible. Within a few hours these flood waves may subside from valleys lying at higher altitudes but in wider valleys at lower altitudes lengthy floods may develop. These floods cause great damage and not only on agricultural land but may set back the irrigation network and traffic infrastructure of the valleys for decades. Lacking flood–prevention projects the local population build obstacles using the wrecks of combat vehicles left over from the Soviet era in the most endangered areas to protect the facilities. (MH ÖHP, 2009: 89)

Operations in Afghanistan underline the principle, known for a long time, that the thorough knowledge of the weather, terrain and hydrography is the basis of planning any military oper- ation. These factors have a fundamental influence on the timing, duration and spatial course of the operations. Under the terrain and soil conditions prevailing in Afghanistan increased fuel consumption and limited travelling speed should be considered. The hindering factors of the terrain and the weather are important from the aspect of applying manoeuvres, commu- nication and support (CAS [Close Air Support], UAV, etc.) opportunities. The width, routing and condition of the roads may restrict the capabilities of the available technical equipment. In case of driving through settlements it should be taken into account that steep slopes and rises, occasionally combined with narrow streets, strongly restrict the opportunity of manoeuvring and turning. This prevails even more for longer vehicles with a big turning radius.

Public health conditions

The quality of natural river water is unfit for human consumption because of the sewage flowing in the region of inhabited settlements and the lack of treatment facilities. In spite of that, locals, lacking anything better, obtain their drinking water from the rivers. It is not a co- incidence that the public health situation is very serious in Afghanistan which is illustrated by the high level of infant mortality (16%) and the life expectancy which is quite low compared to European conditions (45–46 years). (MH ÖHP, 2009: 66)

Due to the environmental conditions of the country analyzed malaria, typhoid, different intestinal infections, rabies, A and B variants of infectious hepatitis, leprosy, bacterial and mycotic infections as well as tuberculosis are real hazards in the country. A significant part of the losses of the Soviet troops once fighting in Afghanistan was caused by such diseases of which infectious hepatitis; typhoid and dysentery were the most outstanding. Different forms of gastric infections can be caught from bacteria in the air. Specific vaccination of the effec- tive forces before missions and the strict adherence to hygienic measures are vital. The strong immune system required under these circumstances demands a

healthy diet and nutrition as well as an opportunity for the body to regenerate. (Hajdú, 2005: 50–53)

In the operation area food and water may only be consumed from controlled sources. Knowing the local customs this is difficult to realize during continuous liaising with the

population because it is bad manners to refuse hospitality. On such occasions one must pay attention and drink preferably hot tea only, and eat only freshly cooked or fried food, and in moderation. For other foods it is recommended to observe the eating habits of the locals and follow them. Such is for instance the peeling of fruit.

Under the climatic conditions of Afghanistan the storage and transportation of foodstuffs is very important. Hygienic conditions are provided at military bases. Problems may arise when there is a power shortage for a longer period because of a technical breakdown and re- frigerators thaw. If that happens large quantities of foodstuff might be thrown out. Sandwich- es hermetically wrapped and stored in cooling boxes are permitted en route, while executing a mission, primarily in winter, but not in the summer. During the execution of lengthier missions ready–to–eat foods including canned food that can be warmed up is the solution.[14]

Generally it can be stated that the majority of infections transmitted by food can be avoided by heat treatment. Regular consumption of warm food is also important from the aspect of maintaining power to resist illness.

Parasitic infections are basically transmitted through physical means (food and beverag- es, physical contact, etc.) therefore the chances of occurrence can be reduced by observing appropriate hygienic stipulations. Regularly washing oneself and one's clothing is the most important remedy for becoming infected with lice.

Malaria presents a serious hazard mainly between March and October.[15] Protection against this disease includes the following: periodic but regular pest extermination around military camps, impregnation of the clothing of soldiers with appropriate substances, tightly woven mosquito netting, and the application of insecticides, spraying the accomodations with repel- lent chemicals and paying greater attention to prevention. It is generally accepted practice that soldiers (when accommodated in containers) "seal" all gaps in the containers that lead to open air with thick adhesive tape when moving in. This provides mechanical protection against the unpleasant visitors mentioned above and also against dust.

The tightly woven mosquito net protects against sandfly (smaller than mosquito) that spreads leishmaniasis in the region of puddles and refuse dumps, at dawn and dusk.[16] The latency period of the disease is 6 months. Sandflies normally fly at low altitudes, below 1 meter. If possible bed height should be arranged accordingly. It is important, because of in- fections, rodents and sandfly problems that the staff preferably does not eat in the sleeping quarters and that the waste collecting vessels are regularly emptied. The high volumes of waste produced in the camps and the content of the sewers should be treated and removed in a proper way. The living and working environment should be regularly cleaned. In order to avoid infections personal relief should be performed in an "organised" manner even under field circumstances, and it is a lot more important to properly wash afterwards.

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14 MRE — Meal Ready to Eat.

15 It is not our intention to give ideas which pharmaceuticals could provide protection against malaria. All the more so because side effects could represent serious hazards in operations like in Afghanistan. Medicine may only be taken under medical supervision, without exception.

16 1–1.5 million people get sick annually in the form affecting the skin and mucous membranes and half a million in the form causing visceral lesions. The estimated number of people infected is 12 million. The disorder occurs in approximately 90 countries and the entire Mediterranean region is considered infected. In certain countries — in Afghanistan also — the infected person himself can be a source of further infections. Source: http://www.webbeteg.hu/cikkek/eloskodok/8598/leishmaniasis (downloaded: 25 02 2012)

The insect, called by the Hungarian soldiers "Nenets" (official name: Paederus — small beetles that can fly, normally active in the night, with a brown–black colour) was able during summer months to cause very ugly and unpleasant, although limited, skin irritation by crush- ing against the skin and getting a liquid, (as a matter of fact its "blood") similar to vesicant chemical weapons, on it. Such injuries started to heal only after several weeks. The physi- cians of ISAF found the "clue" to the phenomenon after several years of observation. The covering of the skin surface as much as possible helps prevent this. (Löchner, 2012: 73–78)

It is advisable to put a concrete bed over the cautiously selected camp site or fill it up to a depth of at least 20 cm with filler consisting of coarse gravel and stones. This prevents the formation of puddles and creeping/crawling insects/reptiles do not like it either. The fact is that due to the geographical and climatic conditions snakes should also be taken into consid- eration, of which several are venomous. Cats are one of the natural enemies of snakes and keeping them in a controlled and moderate manner can be definitely helpful. At the same time contact with animals should be avoided in general, because they are potential carriers of infections. One can expect that spiders and scorpions show up as well as insects having a painful (although not necessarily fatal) bite, and causing problems in the operation of the human body.

Because of the high temperature extraordinarily intensive sweating facilitates the devel- opment of fungal skin infections. This phenomenon may occur even when using advanced water repellent and "breathing" fabrics because the different protective equipment and tacti- cal gear press clothing to the skin to such an extent that it cannot breathe

adequately. In case of staff continuously exposed to this kind of stress, increased attention must be paid to the skin's opportunity to regenerate. Besides using skin care creams it is recommended to lighten the clothing inside the camp, under safe conditions. In this regard the provisions for clothing rules must be interpreted in a realistic manner.

Thorough hand sanitizing before eating should be performed as a routine, both in transit and under the conditions of a military camp. Besides normal hand washing the use of hand sanitizing agents is mandatory. It is practical to use the latter after all occasions when contact is made with the objects of the local surroundings, after relieving oneself, or coming into contact with animals even to the slightest extent. This is true also if normally all soldiers wear gloves in order to avoid injuries. In addition to the smaller hand sanitizing packages in the personal equipment there are disinfectants on the vehicles, in bigger packaging.

Feet and skin care using antifungal preparations should be continuous. Soldiers must be provided with at least two pairs of boots with sole and uppers suitable for the climatic and high–altitude conditions so that they could change them every day. Thus the footwear not in use has enough time to be properly aired and dried. For drying the inner sole of the boots must be removed every time. It is advisable to check the interior of all footwear before putting them on to see if there are any "unauthorized tenants" in them (insects, creeping/ crawling insects/reptiles). This is especially applicable in case of accommodation in tents or if footwear is put outside the closed container for ventilation.

Due to the bacterial content of the air in Afghanistan special attention must be paid to properly dress different kinds of open injuries, as tetanus infection is a real hazard. A warning signal is that even smaller scratches and wounds heal much slower than back home while redness typical for inflammation shows up around the wound. In case of bad injuries efforts must be made to get the injured person into absolutely sterile circumstances as soon as pos-

sible. If this is not done any injury may get infected to such an extent that it results in loss of life or loss of the injured body part.

The increased risk of infection does not only require strict personal hygiene but also the special cleaning and tidying of the occupied living space. Over and above the living envi- ronment this includes the vehicles which are the everyday "workplaces" for many soldiers. These vehicles regularly travel to locations hazardous in terms of infection. In inhabited settlements — in the absence of sewers — sewage water practically flows on the streets and vehicles wade in it. The contamination picked up by the boots of the soldiers and the tyres should be systematically removed from the exterior and interior of the vehicles. The applica- tion of field car washes may seem luxurious at first sight but in the context of the above they operate at certain "relief locations".

In spite of the very strict hygienic provisions and given information almost everyone in the Hungarian contingent — and with some soldiers more than once — that he has to cope with disorders of the digestive system. In most cases the real cause cannot be determined but it is a fact that the missions have to be accomplished under circumstances that are quite pecu- liar to Europeans. The soldiers' immune system cannot be prepared for these circumstances as it is "socialized" under a different virus environment.

However, we can say, that as a whole public health cases did not significantly influence the operations of the Provincial Reconstruction Team. Thanks to the rigorous preventive actions and continuous attention the development of epidemics has been prevented. At the same time we have to state clearly that the importance of medical support cannot be stressed enough.

Summary

Afghanistan, with its particular natural conditions represents a big challenge to all armed forces. Military operations performed in the country require complex and comprehensive preparations and planning. It is essential to thoroughly and cautiously analyze the environ- mental conditions of the missions and to respond to the negative phenomena quickly, cau- tiously and in a carefully assessed manner. For this purpose it is very important to write up military history experiences and the experiences of the soldiers collected on the spot, and to incorporate them into the preparation of soldiers and technical equipment.

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