Organization principles for mine clearing operations in peace time

1. SAFETY AND EFFICACY CONDITIONS

Any given mine-clearing program must be approved by local authorities, either official or not, and this authorization should translate on the ground into active support especially with regards to safety. The organism in charge of the mission, whether a commercial company or an NGO, must have a mandate available to set against the local authorities if necessary. If the operations are part of a national mine-clearance programme, the mandate should take care of all subsequent issues such as customs, veterinary controls for dogs, taxes, immigration matters and visas for the foreigners, privileges and immunity for expatriated experts... Furthermore, a few conditions are required to approve the opening of a worksite. The round should pose no risk of conflict, and be safe from a military point of view, the mine-clearance should bring immediate benefit to the population, especially if the expatriates are soon to return.
The first priority consists in guaranteeing the clearance of areas where the demining equipment itself will be installed, usually for long periods of time, as well as zones of demobilization and reintegration of the combatants and their families (ex. UNITA). The success and rapidity of the operations is tightly dependent upon their safety.

SUPERVISING PERSONNEL

SELECTION OF SUPERVISING PERSONNEL

The selection process is very important and it should take into account the very diversified nature of mine-clearing operations in peace-time. As discussed in the case of Cambodia, minefields may comprise a great number of unexploded ordnance that require specific handling methods. The neutralization of such types of ammunitions is often associated with great risks. It is not unheard of for minefields to actually comprise more unexploded ammunitions than mines. In Cambodia for example, the number of other types of explosive ordnance found and dealt with so far outnumbers the total of mines by up to a factor of eight. Whilst the focus there remains, rightly, on the mines problem, explosive ordnance other than mines is responsible for up to 25 % of the monthly civilian casualties.

There is no doubt that the best trained and most experienced mine clearance experts are drawn from the military, especially those with Military Engineering or Explosive Ordnance Disposal (EOD) service backgrounds. It is important, however, that the right people are selected from within those backgrounds. Both the Military Engineering and EOD fields comprise of a variety of specialist organizations whose personnel are rarely cross-trained to a high standard. It is therefore critical to ensure that the training and supervising personnel selected are those with the widest knowledge of the various kinds of ordnance susceptible to be found, and the highest proficiency not only in mine clearance per se, but also in handling unexploded ammunition. It is not enough to assume that because a person has military experience, he or she is automatically considered as a suitable person to conduct mine-clearing operations, particularly if the person was trained in the Navy or in the Air-Force: although they may hold outstanding military qualification, these personnel are not always trained in minefield reconnaissance, marking, clearance and recording procedures and related disciplines. It is therefore important that the qualifications and experience of EOD / mines specialists are scrutinised to ensure compatibility with the undertaking, and not taken at face value.
In many respects, it would be advantageous to have a set of «minimum qualifications and experience» criteria drawn up, which could be the subject of a contractual obligation, and by which to evaluate prospective candidates for recruitment.

MANAGERIAL STRUCTURE

Once suitable personnel have been recruited, they will need to be effectively motivated and managed. This will be achieved by normal sound management principles, including:
- a sound understanding of the goals and targets to which they will be expected to work
- firm and fair disciplinary procedures
- the establishment of minimal technical standards of work
- the establishment of Standard Operating Procedures (SOP's)

Each mine-clearance worksite should include a managerial structure that will be in charge not only of the daily operational organization and control of the worksite, but also of all missions related to logistic support: housing, food, transportation, telecommunication, management of stocks, of the car fleet and replacement parts, management and maintenance of the equipment for detection and mine-clearance, and of the explosives. That structure includes the physician who has control over all health-related matters, assistance in cases of emergency and evacuation.
The direction of the worksite should be allocated premises with a certain level of comfort both for administrative work and for rest periods. Drinking water and electricity supplies are essential, as well as some sanitary organization offering the possibility to take showers, to wash clothes and to treat water waste including that of the lavatories.

MANAGEMENT OF PERSONNEL

Number of employees and training personnel
Given the large number of subsidiary tasks essential to ensure the proper functioning of a mine-clearance worksite, the logistic and administrative direction should be placed under the responsibility of an executive other than the worksite leader, whose attention should be focused on his primary function. It is important to underline the fact that, although funding may be limited, personnel-related expenses should not be cut down too drastically. This is because, as a general rule, professional mine-clearing teams are fully dedicated to their primary functions and numerous local assistants must therefore be called upon to take over secretarial, relational, maintenance or cooking tasks.

Managing mine-clearing operations is a tedious task that requires professional personnel well aware of the objectives, and at the same time, of safety rules on the worksite. One of the most constraining characteristics is the coexistence on the site of highly qualified, usually expatriated executives with local mine-clearing operators who will eventually turn into executives themselves. At that time, they will be able to pursue the operations without assistance from the outside, in the strict observance of technical and administrative procedures established by the expatriates.

All specialists agree that the size of a mine-clearance team should be 30 men (plus 2 nurses, though). After a 10-year-experience in Afghanistan, this is still the opinion of the U.N. In Angola, enough men are expected to be recruited to create 36 teams of 30 people, each team being supervised by only one expatriate.

As for training personnel, the number of expatriates used to provide assistance to local demining agents varies from one worksite to the other from 8 to 15 %. This ratio decreases as the level of qualification of the local personnel increases. Initially, expatriates are responsible for supervision, health issues and logistics, then the local personnel being trained take over. For example, the ratio of expatriates to Cambodians changed from 1/7 to 1/28, and finally to 1/50. In an average worksite where operations are expected to go on for one year, a team of 5 to 7 expatriates can usually be found permanently (a project manager and his assistant, a physician and a nurse, a Nedex expert, a mechanic and an expert in logistics). It will be remembered that the objective is to give national delegates the full responsibility of mine-clearing operations.

LOGISTICS

A well organized logistics capability is central to any successful demining operation. It concentrates first of all on the movement of personnel and equipment Dealing with foreign Customs and Immigration authorities may well be delicate: the logistician may display a sense of diplomacy to negotiate the amount of taxes for importing equipment. Once in the field, the tasks related to logistics are many and of the utmost importance:

- importation and local acquisition of equipment
- storage and maintenance of stores
- distribution of equipment and stores
- quantitative and qualitative control of edible goods
- inspection and repair facilities for technical equipment
- security of edible goods and equipment whilst in store
- implementation of rules regarding storage and security of dangerous products
- distribution and return of equipment with specific attention given to fragile or dangerous supplies (explosives).

PROTECTIVE EQUIPMENT

Climatic conditions permitting, it is always best to provide the probing agents with protective clothing to protect them against the effects of mine blast and fragments. However this is still the subject of a controversy among the various operators. The arguments of all parties can be discussed.

THOSE WHO ARE FOR THE USE OF PROTECTIVE CLOTHING UNDERLINE THAT THE LATTER

- dramatically minimise the degree of head and body injuries
- are re-usable many times but still can be «sacrificed»

- are well-adapted to the technological level of the mines
- force the user to bear movement restrictions that permanently remind him that he is in a situation of danger
- may be used only in situations where they are necessary, permit to obtain reduction in insurance premiums, especially for the expatriates
- permit to provide maximum safety to the men participating in dangerous activity

Deminer equiped for neutralisation of a device

- give an exemplary nature to the operations in terms of consideration for human rights and human dignity.

THOSE WHO ARE AGAINST THE USE OF PROTECTIVE CLOTHING CLAIM THAT THE LATTER

- may delay assistance and care in case of injuries
- were never demonstrated to actually improve the chances of survival of the mine-clearing agents
- are expensive and their technology is not well suited
- permanently remind of the danger, which could have negative psychological effects
- could raise dangerous excessive feelings of self-confidence in the demining agents
- restrict movements and visual field
- are hot, heavy and unpleasant to wear
- are not taken in consideration in insurance agreements
- are not subject to legal obligation in the countries of interest
- were never requested by the demining agents themselves

This debate is moderated by the fact that many operators, either commercial companies or Non Governmental Organizations, may adopt one point of view or the other depending on the circumstances and the situation. However, it seems necessary that this debate be brought to a close by the bureau of work legislation («BIT»), so that the whole profession has to abide by the same rules in terms of behavior and protection. This is made even more necessary by the fact that should an accident happen, the responsibility of the project manager could be investigated for insufficient security on the mine-clearance site, although no local law or insurance policy had made the use of those protective equipment compulsory for his personnel.

THE COST OF INDIVIDUAL EQUIPMENT

The cost depends on the level of protection that is sought: either head only, or the whole body. It is between 500 and 1 000 ECUs, a sum to which you might have to add the cost of shoes, the characteristics of which are also vehemently debated upon.

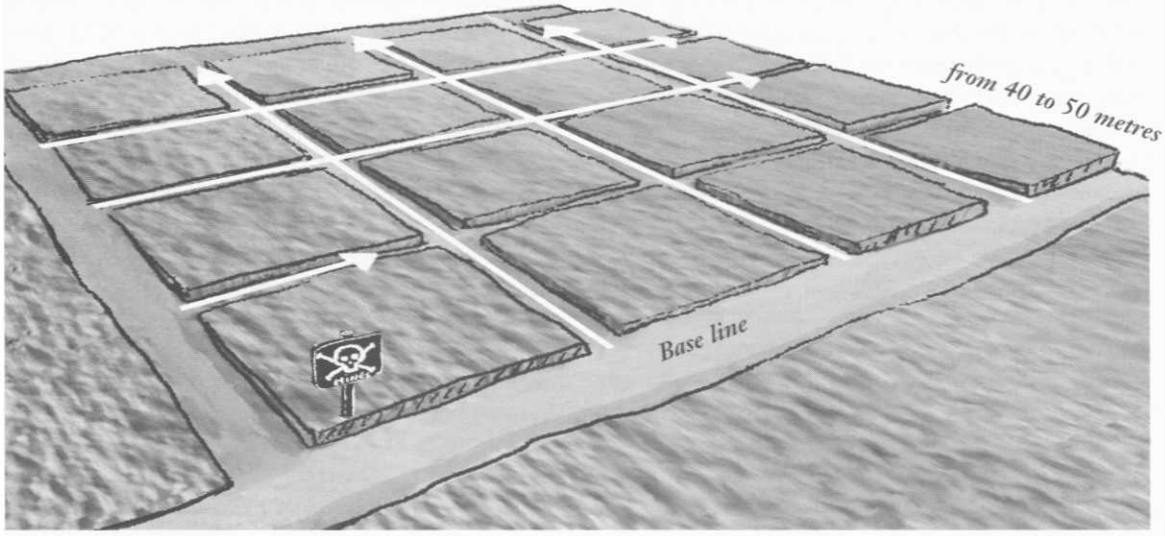
In terms of vehicles, the teams usually travel aboard four-wheel drives, with either normal or long sub frames for non-dangerous trips, or anti-mine vehicles trips across hazardous areas. Obviously these vehicles would not resist the blast of an antitank mine, but they provide sufficient protection against antipersonnel mines. Commercial companies charge between 3 000 and 5 000 ECUs per month for these vehicles, whereas a regular liaison vehicle costs between 500 and 1 000 ECUs per month.

PURSUING MAP-MAKING AND SIGN-POSTING IN THE FIELD

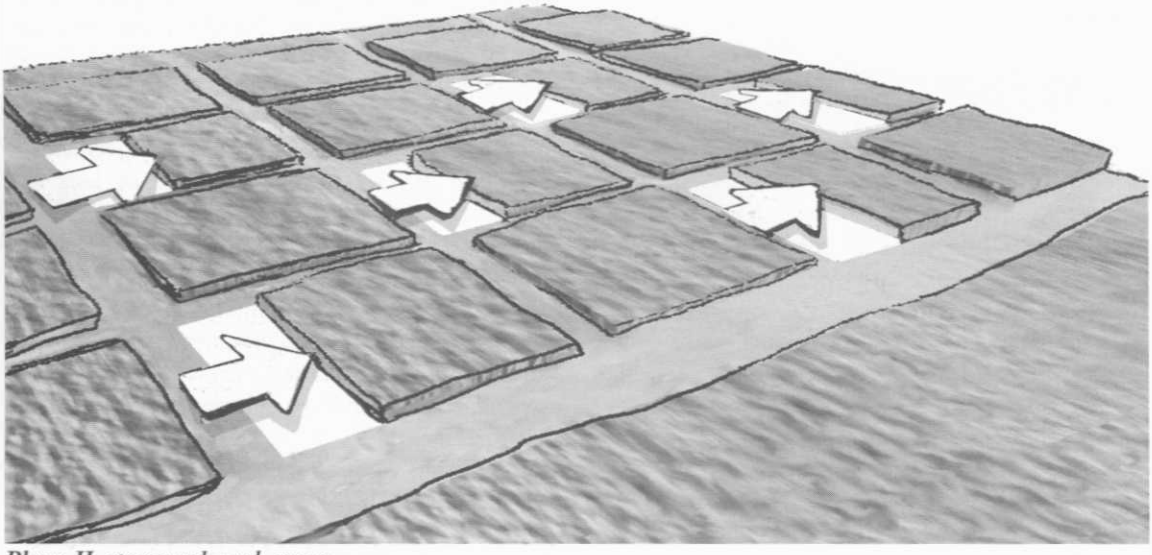
The first issue is to determine the starting points of the mine-clearing operators; it should be addressed by the people responsible for minefield marking. They will the have to pursue their work throughout the progression of the mine-clearing operators. Topographical surveys (landmarks, azimuths, distances) will be used to visualize on a map the daily progression of the operations and sometimes to give a better idea on the original intentions of the bomb-layers, thus helping in orienting subsequent operations. The date, the identification and the area of the section will be indicated on the zones treated. Example: the area treated by the first section is coloured in yellow and the following annotations are written down: 8.10.1225m^2. This indicates that on October 8th, the first section depolluted 1225 m^2.

This document is vital, not only from a contractual point of view but also from an operational point of view, as the study of this document and its day-to-day updating will determine the decisions to be made in the

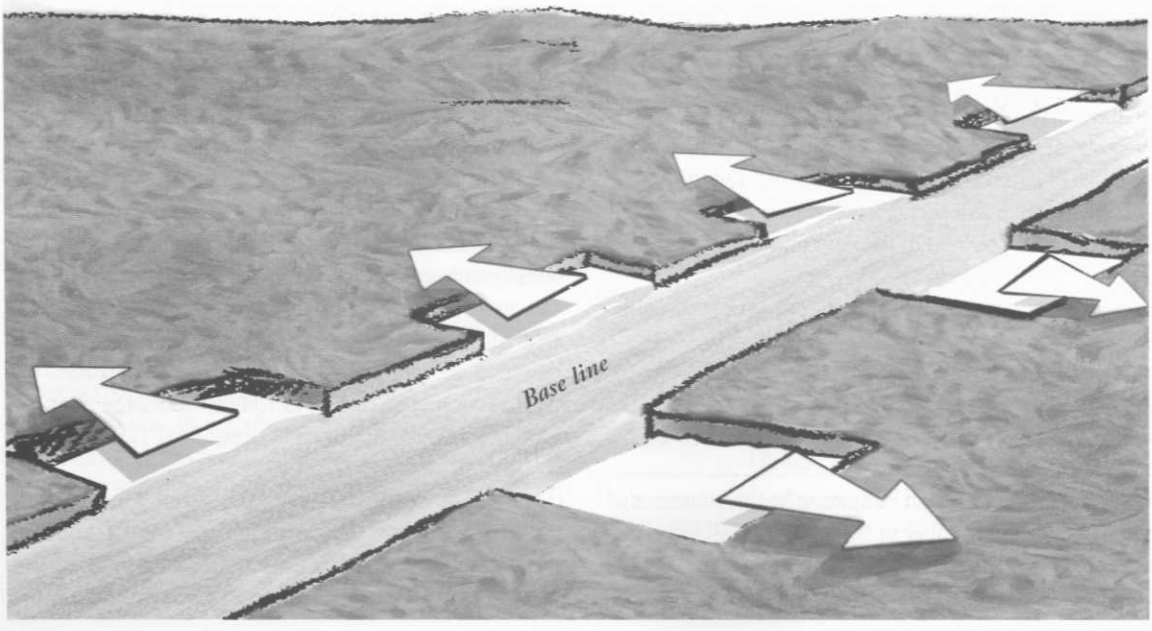
PROGRESSION OF THE DEMINERS



Phase I, breaching lanes



Phase II, staggered work areas



Case of linear working area

course of subsequent steps. Map-making is of vital humanitarian importance in mine action. Not only does it give **consistency to the work done** on the field, but it also helps **evaluate and orient the progression** and, finally, at the end of the operations, it helps **objectivize the work completed.** The document should always be available to the experts in charge of quality control. It will be a key element for the acceptance by governmental authorities of the work completed in the cleared zone.

THE PROGRESSION OF THE DEMINERS

The operators usually progress along pre-determined zones, about 40 to 50 meters long, that they will examine either in staggered or linear rows, as indicated in the following drawings. It is worth noting that this type of organization permits a rational progression, but it also enables a wounded individual to be rescued at no risk.

THE FOLLOW-UP DOCUMENTS

The daily log

All the events of the day are reported in this log. From a technical point of view, the working hours and weather conditions are reported. For each worksite, it is necessary to keep the log up-to-date on the advance of the sections, the areas treated, the summary of discoveries and destruction and various observations likely to influence the safety and effectiveness of the worksite.

For instance:

***Worksite M3** started at 8:00 and ended at 3.00, with a break from 10:00 to 12:00 due to rainfall.*
Section 1: 1250 m2, 4 PMN - 12 POMZ - 4 mortar shells 122 mm in size.
Section 2: ...
Section 3
Section 4: Marking on an 800 m² area 2 PMN2
At the end of the day, the total amount of work completed is: depollution of 4300 m², neutralization / destruction of 8 PMN, 6 PMN2, 8 mortar shells 122 mm in size...

This document is updated on a daily basis and will be used subsequently to generate weekly or monthly activity reports, as well as, in conjunction with cartographic documents, to assess the amount of work completed at the end of the operations.

MONTHLY ACTIVITY REPORTS

It synthesizes the work completed by all worksites placed under the supervision of one co-ordinating authority. The overall report distinguishes between: the areas treated, the number of AT mines, of AP mines, of explosive devices (mortar shells, artillery shells, rockets and propulsion charges, grenades, unexploded submunitions.) This report can also detail peripheral operations such as medical care given to the populations. It is mandatory that all accidents and incidents be recorded (cause, nature of the treatment, evacuation, medical and surgical reports...)

THE END-OF OPERATION REPORT

It is the final report that must be handed in to the **Central National Organism** for the fight against mines and the donors. It comprises a map of the treated zone and a general report on depollution.

2. THE PARTICIPANTS

Neutralization of antipersonnel mines in peace time is a somewhat new occupation for which most expertise emerges from once exclusively military techniques. However it would be excessive to pretend that surveying antipersonnel mines is a speciality per se. Contrary to antitank mines, it seems that antipersonnel mines were **meant for laying, but not for surveying.** The job of mine-clearing operators in peace time includes particular characteristics regarding:

The object itself: irrational scattering of the mines, sensitivity of their firing system, the multiple ways to use them as booby-traps hard to identify, their natural or voluntary concealment within the ground or vegetation.

The duration of the operations: frequently long operations conducted in politically unstable countries or areas where the mines might not be the only risk factor.

The environment: living together with populations whose social structure has been ruptured due to the war, and with a high ration of disabled victims who require rudimentary and yet complex health care.

Technique: slow progression due to the characteristics of the work, to human pace and to the level of expertise; The danger that the mine-clearing operator himself has to face without any guarantee that he would be given the promptest and best suited care if necessary; The necessity -actually the obligation- to train, supervise and protect local mine-clearing operators. The various problems linked to operational organization, logistics, administration and safety.

Contractual obligations, which in most cases are established based upon approximate data and sometimes translate into financial constraints or exceeding of the allocated time.

The high cost of insurance covering the specific risks linked to mine clearance.

The uncertainty of the result which comes back to mind when an accident occurs in a zone supposedly cleared of mines.

Such particularities characterise an activity that will long remain a «non-job». However, humanitarian obligations have, in this particular area, acquired a much greater importance than prescriptive necessities. *Ipso facto* mine-clearance has become a specific activity at the crossroads of **humanitarian emergency, development policy,** and **military expertise.**

Four types of mine-clearing experts can be found on the field:

- **Institutional:** soldiers doing their military service and appointed according to bilateral co-operation agreements or, in most cases, belonging to the U.N. contingents for peace-keeping missions.

- **Non-governmental:** members of associations specializing in humanitarian mine-clearance or occasionally enrolled by other emergency or development associations.

- **Commercial:** employed by service industries. The latter respond to international invitations to tender regarding either the completion of rehabilitation / development programmes, or markets opened by the U.N. agencies, or even peace-keeping missions when the military is unable to provide specialized soldiers in sufficient amount.

There exists in fact some confusion between these different areas and it is not uncommon for NGO's to respond to international invitations to tender, for commercial firms to work for an NGO, for NGO's and firms to enrol retired or active servicemen, or for associations to be directly recruited by the U.N...

The U.N. has been the most important user of mine-clearing experts since 1988, when the organization was given its first mine-clearance mandate in Afghanistan. Since then, it has been conducting mine-clearance programs either as part of the peace-keeping forces, or for strictly humanitarian missions in many countries: Angola, Cambodia, El Salvador; Georgia, Guatemala, Iraq, Somalia, Yemen and ex-Yugoslavia.

- **Village deminers** represent the spontaneous organization of the communities in a situation of survival and have to manage with their own means.

PEACE-KEEPING FORCES

Mine-clearance activities will normally be undertaken by peace-keeping forces in pursuit of their own objectives. Generally speaking, military mine-clearing capacities during peace-keeping operations are limited, expensive, manpower intensive and require a disproportionately high level of support. A military force engaged in peace-keeping activities will be structured in such a way that the bulk of manpower available will be dedicated to the occupation of key areas: patrolling and observing, and self-defense. Such a force is likely to contain support elements including Engineers, Communications, Logistics, Transport etc... But these will be proportionately large (commensurate with the size of the force) and be designed to support the force in its role and to maintain its mobility.

Mine clearance by military forces during peace-keeping operations is normally undertaken by military engineers, or by specially trained soldiers within infantry units (British model). Military engineers, however, have a full range of other duties, ranging from the maintenance of electricity supplies, the repair and maintenance of bridges and roads, establishing and maintaining drinking water supplies, etc... Some limited mine clearing operations might be undertaken by specially trained soldiers within infantry units, for the purposes of unit self protection, or for example to gain access to a vital objective.

In this context, mine clearance activities will be limited to the basic requirements of the unit at the time, within the capabilities of the small resources available. Specially trained soldiers within infantry units will not have the training, equipment or logistic capability to engage in large mine clearance projects

Military commanders and governments are reluctant to commit military human assets to demining on a large scale during peace-keeping operations because, among other reasons, of the perceived high risk of casualties.

During war or conflict, where an army is involved in fighting for example in defense of national territory or to enforce governmental foreign policy, casualties may be acceptable, are often inevitable, in pursuit of the aim of the conflict. This is clearly not the case when military forces are used in external peace-keeping operations, where there is no direct national interest for the countries involved. In fact any democratic government would have difficulty in explaining to its electorate why casualties were being incurred under such circumstances. The scope for peace-keeping forces to become in demining is therefore usually limited to the minimum required to support their own activities.

INTERNATIONAL ORGANIZATIONS

The doctrine of the great international sponsors such as the United Nations and the European Nation is based upon three principles:

• The first consists in clearly **distinguishing between activities related to humanitarian emergency mine-clearance, and development and rehabilitation mine-clearance**. The financial effort is made mainly towards the latter. Mine-clearance therefore becomes a mere part of a long-term program for peace restoration; **a mine-clearance program should now come within the scope of an overall rehabilitation or development program**. Mine-clearance cannot be an aim in itself, but its objective is to contribute to the development of the country.

Besides, some International Organizations have included mine clearance operations as part of their relief operations, for example as a means of getting access to those areas where aid is urgently required. Operations under these circumstances can take place in areas where all necessary infrastructures are missing, and there is no formal or central demining organization. These areas are thus largely uncoordinated in terms of quality control and passage of information regarding the disposition and types of mines. International Organizations usually employ NGO's or Commercial Companies to undertake demining operations on their behalf. These missions are not always satisfactory and they pose specific problems to the administrations concerned: DHA for the United Nations, DG8 and ECHO for the European Union.

• The second consists in developing a national demining capacity with the intent of transferring control and management of this capacity to the government of the country concerned. Initially the organization is set up with experts from participating countries who train the indigenous nationals who will ultimately take over the running of the operation. From a purely technical point of view, the use of these international experts in this way has not been without problems, due to the wide range of cultural, philosophical and doctrinal differences of the nationals concerned, and requires great effort to maintain communication without sacrifice of technical detail.

• The third principle is of prospective nature It is about **consistence and co-ordination**. Since the E.C. started to support activities related to the fight against mines in many countries over the last few years, there has been a strong case for the establishment of an EC Humanitarian Mine Clearance Action and Co-ordination Unit. There is also a clear need for a central depository for the collection and dissemination of information with regards to mine clearance and mine-clearing activities; and especially with regards to technical information about all types of explosive ordnance. Currently the only internationally funded organization for information of this type is the NATO E O.D. Technical Information Centre in Rochester (U.K.). One thing is certain: the mines and UXO problem will be with the world for a long time to come. International Organizations should make a great rapprochement, conceptualization and organization effort in order to give consistency to the operations they finance. Today the operations are often conducted in a heterogeneous and costly manner and frequently with lack of professionalism.
Afghanistan provides an example of a global organization for the fight against mines. This is the oldest and most thorough mine-clearance programme. **(See appendix 7, page 79, «The example of Afghanistan»).**

NGO'S AND COMMERCIAL ORGANIZATIONS

There are many NGO's and commercial organizations involved in demining activities throughout the world. The quality of both types of operator can range from the very worst to the very best. Whilst NGO's might argue that commercial organizations can be too expensive because they are subjected to the laws of profitability, there is an alternative view that some commercial companies can be more cost effective than NGO's by virtue of the fact that they are operating in a competitive market, and they achieve a better profitability.
In reality, such argument is pointless, as the key issues are whether an organization has a managerial structure for **technically qualified human resources**, a good **logistic capability** and the necessary **experience** to undertake demining projects In the context of demining, cheap operations are often only cheap because one of these three conditions is not met. Ultimately this can mean potential death or injury to those involved and to the local beneficiaries whom the operation is meant to help. A main difference between NGO and commercial operations seems to be that NGO's may be involved in «open-ended» demining operations, which may suffer as a result of uncertainty regarding the continuity of funding, whereas, as a rule, commercial activities might be characterized as «close-ended» being probably finite in duration and undertaken within specific and often limited parameters. Both commercial and NGO operations may have results with important developmental implications

Mine-clearance is usually not the primary activity of these companies which have other activities such as security or people's safety. This is an indication that mine clearance is still not a lucrative activity permitting

full specialization, and also that international invitations to tender come within a very competitive context, which makes it difficult to draw any high profit margins from this activity.

Distribution of the competences among NGO's and Commercial Companies:
As of today, the distribution is vague. Regarding national or international public markets, all of the above-mentioned providers of services intervene at some point or another. For the completion of commercial projects such as depollution of an oil-extraction site, or clearance of an electrical line, only private companies have so far intervened.
Due to the cost of mine clearance operations, it is not commercially profitable to implement a depollution program which cannot be easily defined in terms of contractual terms and limitations. Such undertakings, which would include carefully denined limits of achievement as well as, within these limits, more or less precise quantitative and even qualitative objectives, might be characterized as «close-ended». A certain emphasis on the time factor comes into play here whereas, in contrast to NGO's, the very survival of «publically»-owned commercial operations may depend on continuing positive periodic recepts. Infrastructural/commercial contracts are thus more suited to the economics of a commercial concern. It is reasonable to point out that while emphasis is placed on commercial profitability, the results of major depollution operations conducted by commercial companies may have positive macro-economic consequences in regard to the rehabilitation of the country concerned.

On the other hand, NGO mine clearance interventions stress the micro- rather than the macro-economic factor. Put another way, the basis of concern is the human factor over the strictly economic factor. These programmes could be characterized as «open-ended» in the sense that their objectives are not easily limited in strict contractual terms. While most NGO mine clearance programme objectives can be evaluated quantitatively in certain ways, the focus tends to be on the achievement of results which are to some degree intangible: better overal levels of safety, peace restoration, institutional reinforcement... This type of programme is likely to require recourse to a great number of local agents.
This is referred to as **proximity mine clearance.** It is undertaken initially by outside agencies such as NGO's, with the intention of developing mine clearance capability at the local level, with the focus on a capacity to respond immediately and directly to the needs of the local population. Proximity demining operators are formally trained, equipped and organized, and should be seen as a decentralized response to a wide-spread and long-term problem. Eventually, proximity demining capability should become an extension of the national demining capability.
Wide area mine clearance presents problems for both commercial organizations and NGO's. In either case, the time and input of funding and manpower needed to guarantee the depollution of, for example, a vast area of agricultural land, represents a volume of inputs that neither type of organization may be willing to undertake. The use of modern mechanical methods, improved from current standards to achieve more consistent results, may provide better means for both commercial companies and NGO's to consider large area clearance. However, as discussed above, such methods are not yet used on a large scale.

A dual movement may then develop between NGO's and commercial companies to bring them into closer co-ordination with one another. NGO's may become more and more deeply involved in prevention and, for some, in extensive mine clearance. Requiring a long-term presence in the field, NGO's can concentrate on the integration of local mine clearance operators into the local populations or infrastructures, and on linking this to their varied competences in emergency and developmental assistance («micro-economic» approach) On the other hand, the commercial companies may tend to specialize in «intensive» mine clearance, related to «macro-» rehabilitation and development operations. **In this condition, there is an obvious complementarity of both preference and competence which should encourage a closer co-ordination among these two types of operators.**

VILLAGE DEMINERS

Village deminers is a term in use to describe indigenous villagers who, through force of circumstances are compelled to search for and destroy land mines, in the absence of any formal organization able to take on the task. This type of demining activity should not be confused with proximity demining which is the name given to demining undertaken, initially by outside agencies. Similarly, the village deminer, who usually has received no appropriate training, should not be confused with national deminers trained in specialized centers.
As indicated above, the activity of the village deminer (searching and destruction of mines) is the consequence of the absence of any appropriate structure· it is imposed through force of circumstances Although they may have had some experience with mines, usually during the war, such experience is likely to have been limited, or even to have been concentrated on the laying of mines rather than on their clearance. Village deminers generally have received no specific training in mine clearance and have no access to such standard items as mine detectors or to any security or medical back-up capacity.

Village demuners can be found in remote villages or centres of population where land mines affect the villagers' lives to the extent that they are unable to:

- Graze cattle
- Draw water from wells or rivers
- Plant food crops
- Travel to neighbouring villages
- Move about the countryside at no risk

Village demuners, often demobilized soldiers, are more than likely to consider their work as an income generation strategy. Demining is generally undertaken in exchange for payment which could be in cash or in kind, the latter including a proportion of the crop grown on the demined land, a herd animal or property. No one knows how many village demuners there are in countries such as Cambodia or Mozambique and the existence of these unofficial demuners may only come to light when one is killed or suffers injury during the course of their work.

The methods employed by village demuners to find mines are, in the main, crude or rudimentary, relying on, perhaps, sharpened sticks used as podders, or farm implements. When a mine is found, the village demuner has several choices of action, all of them dangerous, with regard to the disposal of the offending item; he can:

- try to burn the mine in situ
- try to neutralize the mine and remove it
- try to detonate the mine by throwing rocks at it
- remove the mine in its armed state

All these alternatives are dangerous and may result in the village demuner being severely injured or killed. A final alternative, to mark the mine and call for professional assistance, is very often no choice because with the mine in situ, the land or access cannot be used and many months may elapse before formal assistance is available. It is this situation which most likely gives rise to the existence of svillage demuners» in the first place, and which, along with the fact that it reflects at the same time the measure of desperation of the community, is an essential rationale for the establishment of decentralized proximity demining capabilities as noted above.

The problem of the final disposal of mines located by village demuners is a serious one. The method consisting in burning whole stacks of mines, frequently used by Cambodian demuners, should only be used with mines whose explosive has lost its characteristics by removal of the booster and whose casing is made of plastic material. This traditional method is well controlled and does not, apparently, cause any casualties It still requires a minimum of expertise.

Currently, the best method of disposing of mines is to destroy them using explosive means. But in countries like Cambodia, Angola, Mozambique, it is prohibited to supply individuals with explosives and explosive accessories outside of formally organized and supported official demining organizations

The recovery of explosives contained within UXO or mines is one way in which village demuners might overcome this problem. However, explosive recovery, in addition to the obvious dangers to the practitioner, is also undertaken for other reasons - in particular for fishing. When this happens, the dangers to the individual inherent in the explosive recovery are compounded by the dangers to the environment as a result of this practice Besides, there is a possibility that some village demuners might resort to incresing their income by selling mines or other ammunitions.

There is continuing debate on the possibility of bringing practicing village demuners into a more controlled and formal context. Doing so would take advantage of a human resource that is already responding to community felt needs and which could conceivably work as a complement to government and NGO capacities. However the logistics of such a programme, as well as the question of consistent quality control and even problems of legal responsibility seem to work against this possibility. Thus currently, where identified, village demuners are either actively discouraged or are ignored by mine clearance authorities and practitioners.