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 P.MN - 12 POMZ - 4 mortar shells 122 mm in size.
Section 2: ...
Section 3
Section 4: Marking on an 800 m² area 2 P.MN2
At the end of the day, the total amount of work completed is: depollution of 4300 m², neutralization / destruction of 8 P.MN, 6 P.MN2, 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 deminers 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 deminers, 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 deminers there are in countries such as Cambodia or Mozambique and the existence of these unofficial deminers may only come to light when one is killed or suffers injury during the course of their work.

The methods employed by village deminers 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 deminer 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 deminer 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 «village deminers» 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 deminers is a serious one. The method consisting in burning whole stacks of mines, frequently used by Cambodian deminers, 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 deminers 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 deminers might resort to increasing their income by selling mines or other ammunitions.

There is continuing debate on the possibility of bringing practicing village deminers 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 deminers are either actively discouraged or are ignored by mine clearance authorities and practitioners.