

UXO Sector Evaluation Lao PDR June-July 2008

Final Report



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List of Abbreviations

| | |
|------------|---|
| ADB | Asian Development Bank |
| AusAID | Australian Government Aid |
| CA | Community Awareness |
| CBA | Cost benefit analysis |
| COPE | Cooperative Orthotic and Prosthetic Enterprise |
| EOD | Explosive Ordnance Disposal |
| ETS | Enhanced Technical Survey |
| FAO | Food and Agriculture Organization |
| FSD | Swiss Foundation for Mine Action |
| GICHD | Geneva International Centre for Humanitarian Demining |
| GOL | Government of Laos |
| Ha | Hectare |
| HIB | Handicap International Belgium |
| IMAS | International Mine Action Standards |
| IRR | Internal rate of return |
| IRRI | International Rice Research Institute |
| JICA | Japan International Cooperation Agency |
| JMAS | Japanese Mine Action Service |
| MAG | Mine Action Group |
| MLSW | Ministry of Labor and Social Welfare |
| MOE | Ministry of Education |
| MOFA | Ministry of Foreign Affairs |
| MOH | Ministry of Health |
| MPI | Ministry of Planning and Investment |
| NAFRI | National Agriculture and Forestry Research Institute |
| NRA | National Regulatory Authority |
| NRC | National Rehabilitation Center |
| QA, QC, QM | Quality Assurance, Control, Management |
| STA | Senior Technical Advisor |
| TA | Technical Advisor |
| UNICEF | United Nations Children's Fund |
| UNDP | United Nations Development Programme |
| UNIDO | United Nations Industrial Development Organization |
| UXO | Unexploded ordnance |
| WFP | World Food Programme |

1. Executive Summary

Overview

This document reports the findings, conclusions and recommendation of an Evaluation of the UXO sector in Lao PDR carried out from 16 June to 18 July 2008. The evaluation was organized and funded by UNDP in consultation with the Government and concerned donors and operators. The four objectives of the evaluation were stated as follows:

1. Evaluate progress of the UXO Sector against the three objectives of the National Strategic Plan. Also examine the National Strategic Plan and make recommendations for revisions;
2. Evaluate whether the structure of the UXO Sector is correct and if the NRA is providing effective leadership, governance and coordination as stipulated in Part IV, Institutional Arrangements of the National Strategic Plan;
3. Evaluate the efficiency and effectiveness of UXO Lao and the progress achieved against its strategy; and
4. Review and assess the effectiveness of Government and donor support provided to the UXO Sector and the implementation of the National Strategic Plan.

Key findings, conclusions and recommendations are presented in the order the chapters of the report.

Review of the UXO Problem in Laos

Population growth in rural areas and other socio economic trends are increasing the demand to put unused land into production thereby increasing human contact with UXO-contaminated land. In addition, mining, hydropower and plantation projects are being implemented in areas with UXO contamination. These activities coupled with tourism-related building are driving spending on construction. Construction requires iron reinforcing bars (rebar). The demand for rebar has expanded the search for scrap metal, the primary ingredient in rebar. Bomb fragments and shrapnel are a major source of scrap metal. With rising prices and demand for scrap, the collection of scrap metal is likely to continue to contribute to informal and undocumented clearance of UXO.

Updating a study of agricultural land use carried out by JICA in 2001, the Evaluation Team has attempted a new estimate of contaminated, unused land whose productive value would make its UXO clearance worthwhile for agricultural development. The exercise, which used a number of generous assumptions, yielded the following results: 22,000 hectares of land are available, which at current rates of clearance, could be cleared in 16 years. A number of potential refinements to the calculations and adjustments to clearance capacity could reduce the time to 10 years.

UXO Sector Performance

The objectives in the National Strategic Plan for the UXO Programme in Lao PDR for 2003-2013 are as follows:

- a. Community Awareness: “UXO/Mine Risk Education (MRE) teams will visit and deliver MRE training to all impacted communities in Lao PDR (as identified in the 1997 National Impact Survey), and UXO/mine accidents will be reduced to a national accident rate not exceeding 100 persons/year”;
- b. Survey and Clearance: “All agricultural areas considered to be ‘high priority’ will be cleared, as well as a sizeable portion of other areas identified as ‘medium priority’ – for a total of no less than 18,000 hectares (180 square km) of land cleared by UXO Lao alone”;
- c. Victim Assistance: “A national database on Mine/UXO accidents (covering all 18 provinces) will be developed and updated regularly, to feed into the prioritization of clearance and MRE tasks. The specific needs of survivors of UXO/mine accidents, in terms of both physical rehabilitation and socio-economic integration, will be factored in all national/local public health initiatives”;

Progress towards these objectives was found to be as follows:

- Given that UXO Lao alone has conducted community awareness activities in 6,659 villages over the last ten years and that other operators also conduct risk education activities, it is likely that community awareness activities have reached the 2,861 villages identified in the National Impact Survey of 1997. However, there has not been any check off process to ensure that the villages where community awareness activities are conducted are indeed on the list of impacted villages.
- The NRA office currently estimates the number of UXO victims at 300 per year, far above the target of 100 persons per year. It should be noted, however, that the target in the Strategic Plan was set without the benefit of a credible accident and victim data baseline. As data has become available, it has become clear that the target in the Plan was unrealistic.
- The national database on UXO accidents, including historical data, should be fully operational by year-end.
- The needs of survivors of UXO accidents are incorporated into national and local public health, social welfare and vocational education initiatives. The concerned Government organizations accept full responsibility for the needs of survivors and do not discriminate against victims on the basis of cause of accident in the provision of health and social services. In other words, health and welfare services provided to UXO victims are at the same standard as those provided to victims of other accidents. The adequacy of those services is another matter.
- UXO Lao’s area clearance target between 2003-2006 was 5542 Ha. Actual clearance during the period was 5798 Ha. At current rates of clearance, the target will be achieved by the end of 2013.

- No records have been kept in regard to the distribution of high and medium priority.

The National Regulatory Authority

The Government created the NRA in 2004. The Prime Minister's Office established the legal framework for the NRA office in 2006 and, with project support from UNDP and other international donors, the NRA office was set up in that year. Thus, the NRA office has been in operation for only a little over two years and is still a work in progress. At this writing, the basic organizational structure of the NRA office is in place to address the core functions of the NRA, Lao personnel have been hired for management and technical positions, and a core of six international technical advisors are on board – provided by various donor organizations - to provide technical guidance and build capacity. In general, the office has been established in an expeditious manner and its operations moving forward smoothly, if slowly.

At present, the NRA office is an unsustainable structure, supported entirely by funds from UNDP and other international donors. All Lao personnel working at the NRA office are paid by from project funds. The NRA office is currently dependent on the donor funding arrangements that are likely to prove to be unpredictable.

The NRA office is leading a number of substantive initiatives in the sector. These include:

- Promotion within the Government of Lao PDR of accession to the cluster munitions treaty. Accession to this new convention may bring with it substantial new resources that could be used for additional UXO activities.
- Promotion of implementation and review of the current strategic plan, “The Safe Path Forward”, which was approved before the creation of the NRA.
- Providing basic data and reports to stakeholders in Government and the international community on UXO activities and achievements against the national strategic plan.

In other areas, more needs to be done. The NRA and the NRA office have not been able to fully communicate the new role and functions of the NRA to all concerned parties. As yet, many in Government do not fully understand that UXO Lao and the NRA have become separate entities and the nature of the NRA's regulatory functions.

On another issue, NRA leadership on the mobilization of Government resources to support UXO institutions and programs has not been bold enough to satisfy some donors who regard Government financial contributions to NRA and UXO Lao as too low and as a sign of lack of Government commitment to the sector.

The NRA office has carried out some useful coordination work in the sector.

- The NRA office with strong donor support has organized sub-sector working groups of all interested stakeholders on UXO clearance, risk education, and victim assistance.
- A sector-level working group has been organized and held its first meeting in mid-July.

In regard to governance functions within the sector - accreditation, quality assurance and post clearance assessment - the office has been moving forward slowly.

UXO Lao

In general, the findings of the evaluation on UXO Lao are reasonably positive. Since 2002, UXO Lao has gone through some significant changes in size and scope, and is now positioned as an ‘operator’ in the sector providing services in area clearance, roving clearance and community awareness. It is successfully meeting its clearance targets.

However, there are some detailed observations about the current structure and performance of UXO Lao that are still worth further attention.

Prioritization is the key issue in the context of the UXO sector. If UXO Lao’s targets are not appropriate, the impact of its activities is unlikely to be optimum. The Evaluation Team finds that the prioritization process used by UXO Lao is complicated, unwieldy and, as a result, rather unresponsive. Another facet of the UXO Lao prioritization process that contributes to this unresponsiveness is the inflexibility of provincial work plans. Work plans are prepared for the year and it appears that new urgent tasks are not readily accommodated, because “they are not in the work plan”.

Community awareness activities appear to have reached diminishing returns. A case study of Champassak Province suggests a weak relationship between the UXO accident rate and community awareness. The case study suggests that people who are able and willing to modify their behaviour have done so, and that we are now in a situation where provision of ‘knowledge’ about UXO is unlikely to make much of a difference; i.e. the community awareness activities are in a situation of diminishing marginal returns.

The main target established for UXO Lao in the National Strategic Plan is for area clearance. Roving tasks are not mentioned. As a result, UXO Lao managers are highly focussed on planning and managing area clearance. In addition, there is a prevalent sense of risk-averseness amongst UXO Lao managers about dealing with large aircraft bombs, resulting in a backlog of these roving tasks. As noted in Chapter 3, an increase in roving activities appears to be critical in order to address the problems of UXO accidents among the population of intentional risk takers.

A survey method that results in land being deemed free of UXO on the basis of a sampling procedure would greatly enhance the productivity of clearance activities. Unfortunately, no such method has been discovered. The “Enhanced Technical Survey” recently introduced by UXO Lao has a low level of statistical confidence and, in any event, does not result in savings of time or labor. Its apparent success is based on the fact that it has been applied on land with a low probability of contamination.

UXO Lao and the other area clearance operators lack a sound methodology for cost capture. Such a method is essential for sustainable operations and for “level playing field” tendering in a market where some operators are subsidized to varying degrees and others operate on a commercial basis. The report provides a standard methodology for full cost capture.

Government and Donor Support

The Evaluation Mission’s findings on Government and donor support to the UXO sector are reported in relation to key elements of the Vientiane Declaration. Key findings include:

- Numerous Government offices including the Office of the Prime Minister, the Ministry of Labor and Social Welfare, the Ministry of Health, the Ministry of Education, the Ministry of Foreign Affairs, and many provincial and district offices are actively participating in and making in-kind contributions to the UXO programme. Direct financial contributions have been negligible, however.
- While UXO operators have aligned their activities with the national UXO strategy, other development agencies have not fully integrated UXO issues into their plans.
- Unresolved systemic issues in regard to the efficacy of Government systems retard the use of Government systems and procedures.
- The sector is sufficiently well coordinated and programme-oriented under the mechanisms (working groups) that have been put in place.
- Given the dearth of direct Government funding, donors can take a great deal of credit for the successful implementation of the key aspects of the National Strategic Plan.

Despite clear evidence of Government commitment to the sector, many activities in the sector have the appearance of being donor-driven. Donor support for the sector has been generous, perhaps excessively so. The NRA office and UXO Lao have a total of 14 international technical advisors. With support and funding on this order of magnitude available, the Government has had little incentive to provide counterpart funding.

Recommendations

The Evaluation Mission has provided 8 pages of detailed recommendations in Chapter 8. Chief among them are:

- Using the results of the scoping exercise to develop a time-bound programme for large scale clearance of UXO;
- Integrating UXO strategic planning with national socio-economic planning;
- Re-orient the sector to focus on two areas, accident prevention and area clearance;
- Targeting accident prevention on high risk groups – intentional risk takers – who are opening and farming contaminated land or engaged in the scrap metal trade;
- Expand roving teams to deal with spot UXO tasks and support accident prevention;
- Expanding the regulation and oversight of the NRA office to include large scale development and investment projects;
- Maintaining the status of the NRA office and UXO Lao as GOL-UNDP programmes;
- Encouraging MOFA to reform the cumbersome MOU process;
- Determining the locus for long-term bomb disposal capacity in Government and taking steps to create and institutionalize that capacity.

2. Introduction

Background

This evaluation assesses the progress of the UXO sector in Laos against the ten-year (2003-2013) National Strategic Plan for the sector entitled, “The Safe Path Forward”. The findings and recommendations of the evaluation are intended to provide vital information for the review and revision of the National Strategic Plan.

Objectives of the Evaluation

The objectives of the evaluation include:

1. Evaluate progress of the UXO Sector against the three objectives of the National Strategic Plan. Also examine the National Strategic Plan and make recommendations for revisions;
2. Evaluate whether the structure of the UXO Sector is correct and if the NRA is providing effective leadership, governance and coordination as stipulated in Part IV, Institutional Arrangements of the National Strategic Plan;
3. Evaluate the efficiency and effectiveness of UXO Lao and the progress achieved against its strategy; and
4. Review and assess the effectiveness of Government and donor support provided to the UXO Sector and the implementation of the National Strategic Plan.

Parameters of the Evaluation

This evaluation does not report the details of activities of the stakeholders in the sector. Such data is available from the annual reports of the NRA office. These reports are detailed and clearly presented. Further, the evaluation team was unable to meet with every stakeholder in the sector. The evaluation is therefore based on review and analysis of a large sample of the activities of key stakeholders in the sector and is not intended to cover every activity and actor.

Evaluation Methodology

The evaluation team has conducted the evaluation by using the following methods:

- Review of available, relevant literature including other evaluations, studies, project documents, work products, etc.
- Meetings with key stakeholders individually and in groups including, the National Regulatory Authority, UXO Lao, concerned Government ministries, UNDP, UNICEF, WFP, donors (Australia, USA, Switzerland) and NGO partners (MAG, Handicap International) *inter alia*. (See list of interviews on file at the UNDP country office.)
- Field visits to Sawannakhet, Champassak, and Saravane.

- Investigation of the scope of the UXO problem in Laos.
- Analysis of findings, development of conclusions and recommendations including informal reviews with stakeholders.

The “findings” sections of the report are prepared in the context of the Organization for Economic Cooperation and Development (OECD) development evaluation criteria, which are summarized in Annex 1.

The Country Context: Socio-Economic Trends

Lao PDR is one of the poorest countries in East Asia with per capita income estimated at \$500 in 2006. The United Nations categorizes Laos as a Least Developed Country (LDC). Nevertheless, despite a hiccup during the Asian Financial Crisis (1997-99), the economy has been growing robustly for most of the past 15 years. The incidence of poverty fell from 46% in 1992-93 to 33.5% in 2002-03, in terms of the national poverty line (\$1.50 per day of income).¹ During 2002-06, the economic growth rate averaged 6.8% and in 2007 reached 8%. Inflation recently peaked at over 15% in 2003, but declined steadily to 4% last year. The prospects for the remainder of 2008 are for continued strong growth of nearly 8% with a jump in inflation to 5-6%².

The population of Laos was 5.62 million in March 2005 according to the official census. Population growth has been steady at 2.0-2.1% over the past decade and is projected to continue to rise at the same rate. According to the census, the proportion of people living in rural areas is 73%, down from 83% ten years earlier. Despite this shift in proportions, multiplying the percentage of rural population at each census by the respective total population yields the result that the rural population grew by roughly 310,000 between 1995 and 2005.

The main drivers of economic growth in Laos are related to the healthy performance of its major trading partners. The strongest sectors include hydropower, small-scale manufacturing, mining and tourism. The agricultural sector remains the largest component of GDP, but its growth is much slower than that of the main drivers and its share of the economy declined from 53% to 42% of GDP from 1996-2006. A number of factors - growth in hydropower, mining, and tourism and increased urbanization - have combined to provide large stimulus to the construction industry, which is visibly booming in many areas.

Linkages to the UXO Sector

The socio-economic trends outlined above are increasing the demand to put such land into productive use and therefore human contact with UXO-contaminated land.

Population growth in rural areas is increasing the demand to put unused land into production. Mining, hydropower and plantation projects are being implemented in areas with UXO contamination. These activities coupled with tourism-related building are driving spending on construction. Construction requires iron re-enforcing bars (rebar). The demand for rebar

¹ Lao PDR Economic Monitor, World Bank, November 2007.

² Asian Development Outlook 2008, Lao PDR, Asian Development Bank.

has expanded the search for scrap metal, the primary ingredient in rebar. Bomb fragments and shrapnel are a major source of scrap metal. With rising prices and demand for scrap, the collection of scrap metal is likely to continue to contribute to informal and undocumented clearance of UXO.



Figure 1. A cheap metal detector on sale in the market in Xepon, Savannakhet. The Evaluation Team was offered this one for around \$18.

3. Reviewing the Scope of the UXO Problem in Laos

Background

In the 2002 evaluation of the UXO Sector in Lao PDR, the work done by the Japan International Cooperation Agency (JICA) on a plan for agricultural development³ was incorporated into the literature used for the evaluation report. In particular, it was noted that there was only a comparatively small relationship between the land that could be developed for agricultural use in Lao PDR and land believed to be contaminated by UXO. The JICA report revealed that only some 23,680 hectares of potential agricultural land was believed to be contaminated by UXO. A simple division of this figure using the UXO clearance productivity figures available at the time (UXO Lao in 2001) allowed the 2002 evaluation report to conclude that, at the prevailing progress rates, the impact of UXO could be effectively removed after some 34 years⁴.

In revisiting the UXO sector in Laos in 2008, a similar conclusion can be drawn, although the results are somewhat different. The methodology and the findings are set out below.

Methodology

In preparing this scoping exercise, there are some principles that should be considered

- Some land is simply “not worth doing” when resources are scarce.
- Given the low population density, there is a limitation in terms of how many people could actually occupy the contaminated land.
- There is strong indication from donors that a means to identify a quantifiable requirement will improve resource mobilization for UXO clearance in Lao PDR.

The aim of this exercise is to build a capacity big enough to deal with all of the likely major clearance requirements, many of which cannot be foreseen at present. Agricultural land is used as a benchmark, but this is a ‘scoping’ exercise not a ‘prioritization’ exercise: prioritization issues (and the need to fit in with other development initiatives) are discussed elsewhere in this report. The aim of the scoping exercise is to determine how large a UXO clearance capacity should be developed and operated, given scarcity of resources; the point is to identify which types of land would be economically⁵ beneficial if cleared. By using agricultural land as a benchmark, it means that the clearance capacity can be used gainfully even if no other higher priority tasks appear. Where a cost-benefit analysis identifies categories of land for which clearance would appear to be nugatory, and it is not possible to drive down the real, full costs of the clearance, then it might be more appropriate to spend the money that would be required to clear that land on other development interventions that can

³ Master plan study on integrated agricultural development in Lao People’s Democratic Republic, October 2001, by Nippon Koei Co., Ltd and KRI International Corp

⁴ “Mission to Assess Future Sustainable Options of the Lao UXO Trust Fund and the UXO Lao Mine Action Programme”, Keeley, Alison Allcock, Singthilath and Kongsaysy, September 2002.

⁵ The word ‘economically’ is used here in the formal sense, with economics being “the science of the allocation of scarce resources”. It should not be confused with the word “commercially” with which it is sometimes confused.

be shown to have a greater impact on development and poverty reduction, especially under conditions of scarce resources.

The methodology for the scoping study in 2008 is slightly more sophisticated than that used in 2002, in that it includes a formal cost benefit analysis (CBA). The CBA is based on the value of agricultural land that could be classified as safe productive land once cleared of UXO. The value is measured in terms of the market value of the crops (including cattle and goats) that could be grown on that land, with future values discounted at an appropriate rate. The quantity and prices of the various outputs were found at the National Agriculture and Forestry Research Institute (NAFRI) with some additional guidance from FAO and the International Rice Research Institute (IRRI)⁶.

In determining the spatial information, the Evaluation Team tried first to replicate the potential agricultural area identified by the JICA study. The JICA study is still available in a number of offices in Lao PDR, but unfortunately the 'shapefiles' (the computer data used by geographic information (GIS) systems to plot areas on a map) could not be located. However, the same 1997 geographic information is available at the NRA office, and the database unit provided significant effort in assisting in the plotting and preparation of various maps for the Evaluation Team. An example of one of the JICA maps is included as Figure 2 below.

The 1997 geographic data identifies areas that could be considered as potential agricultural land. These were then divided as follows:

- Firstly, the potential agricultural area within the 47 poorest districts in Lao PDR was identified⁷. The 47 poorest districts are shown in the map at Figure 5 below.
- Secondly, this land was divided into different categories by slope, using the same gradients used by JICA, namely
 - Land under 8 degrees of elevation (suitable for paddy rice)
 - Land between 8 and 16 degrees (suitable for upland rice)
 - Land between 16 and 37 degrees (suitable for grazing or forestry)
 - Land above 37 degrees (unsuitable for development)

In 2001, JICA were also able to further divide this land according to soil types and rainfall; this data was unavailable to the Evaluation Team, which means that the results of this scoping study should be considered as having over-estimated the available potential land for agriculture. This point will be considered further below.

The second treatment of the spatial information was to overlay the area of potential UXO contamination. In 2001 less bombing data was available and a risk assessment process of 'bomb density' was used. In 2008 there is more bombing data available. The NRA office

⁶ The methodology was tested as part of research undertaken at Imperial College London by one of the Evaluation Team members, used in the 2004 evaluation in Cambodia, and subsequently validated as part of a project conducted by the Survey Action Center (SAC) for the US Department of State in 2007. Full background documentation on the methodology is available at the SAC website.

⁷ Note that the potential agricultural area appears to be mainly within the poorest districts, as it appears that most of the potential area that is in the richer districts is already developed. Presumably this is why they are richer (or vice versa).

database team was also able to separate out the cluster munitions bombing data which is more relevant in this context. A buffer of 500m was placed around each cluster-bombing record and the area of the resulting potentially contaminated land was calculated.

This scoping model appears to contradict the requirements of the forthcoming Oslo Convention banning cluster munitions. As at the time of writing this report, the Evaluation Team heard that Lao PDR intends to sign this treaty at the end of 2008. However, the formulation of the treaty (particularly in Paragraph 2 of Article 4) recognizes the needs of some States Parties to depend on assistance from others, and also (in sub Para 2a of Article 4) to make priorities for clearance. Endorsement of the scoping mechanism described above, or a variant of it, would actually allow Lao PDR to be compliant with its requirements under Sub Para 2a of Article 4, pending the successful mobilization of sufficient resources to clear all UXO even in the most inaccessible parts of Lao PDR.

Results of Spatial Analysis and CBA. Table 1 below sets out the results of the spatial analysis, showing contaminated land based on its potential agricultural use within the 47 poorest districts. The total area is some 200,000 hectares (Ha), which would be around 50 years of work at today's clearance rates, out of a total contaminated area of some 500,000 Ha.

This area (200,000 Ha) is some 10 times larger than the result arrived at in 2001 by JICA. This results is likely to be because of (a) not having access to all of the constraining factors, and (b) having access to more bombing data, both of which have increased the estimate of the size of the contaminated land that is *potentially* worth clearing. However, the CBA reveals how much of this land should be cleared at today's prices. The summary of the CBA results is in Table 2 and Table 3 below. Note that four options are considered:

- Option A: Clearance of all potential paddy and potential upland rice
- Option B: Clearance of all potential paddy and 20% of potential upland rice, with the remaining 80% of potential upland rice being released by technical survey.

This classification is repeated for Options C and D, with only the highest category of potential upland (referred to in Table 1 as 'Agriculture <16.5 degrees'). Thus:

- Option C: Clearance of all potential paddy and highest quality potential upland rice
- Option D: Clearance of all potential paddy and 20% of highest quality potential upland rice, with the remaining 80% of potential upland rice being released by technical survey.

The results of the CBA are included at Table 2 and Table 3 below. The key findings are summarized in Table 4. Electronic versions of the full CBA calculations are available in Microsoft Excel format from the Evaluation Team

The assumptions carried out in this CBA are generous, in that they are deliberately selected to consider the 'worst case' requirement for clearance. For example:

1. No account is taken of the large areas already cleared by UXO Lao and the other organizations since 2002.

2. No account is taken of the large areas subsumed by the 65 hydropower projects and the 181 mineral concessions throughout Lao PDR⁸.
3. As mentioned above, no attempt has been made to include the two other constraints used by JICA, namely soil quality and rainfall. Inclusion of these constraints would be likely to significantly reduce the potential agricultural area.
4. Work done by the World Food Program suggests there is only a weak relationship between the potential existence of UXO contamination and the utilization of land⁹. Therefore, the Evaluation Team feels that it is likely that a large proportion of the highest value contaminated land will already have been put into use by the rural population. Indeed, this would result in a greater requirement for roving tasks rather than area clearance.
5. The table of potential contaminated land is regarded as an upper limit.
6. A further constraint can be extrapolated from the fact that the 1997 UXO Survey found 2678 contaminated villages in the nine provinces where UXO Lao operates. If one accepts an average of 100 households per village, and also accepts the principle that the maximum plot of *additional* land that these householders could utilize is one hectare, the maximum area that would need to be cleared is 267,800 hectares. This is approximately equal to the total amount of potential land identified by the CBA process, and as such provides a useful triangulation.

⁸ Source: Vientiane Times, 14 July 2008

⁹ See the WFP Comprehensive Food Security & Vulnerability Analysis (CFSVA) for 2008, which says that “Only 3 percent of the households reported owning land that is not in use due to UXO contamination”.

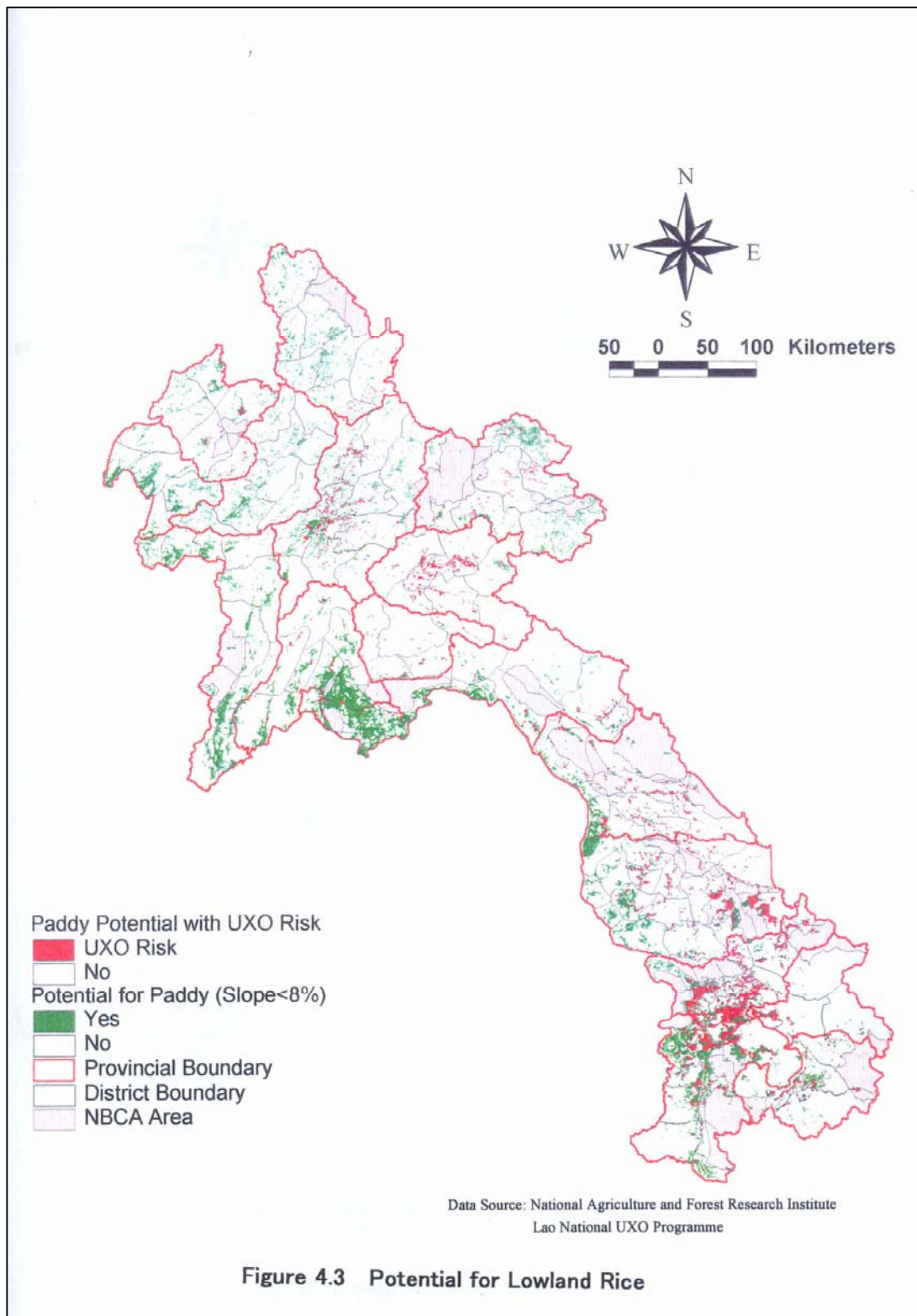


Figure 2: JICA map showing where UXO contamination threatens potential lowland rice growing areas (2001).

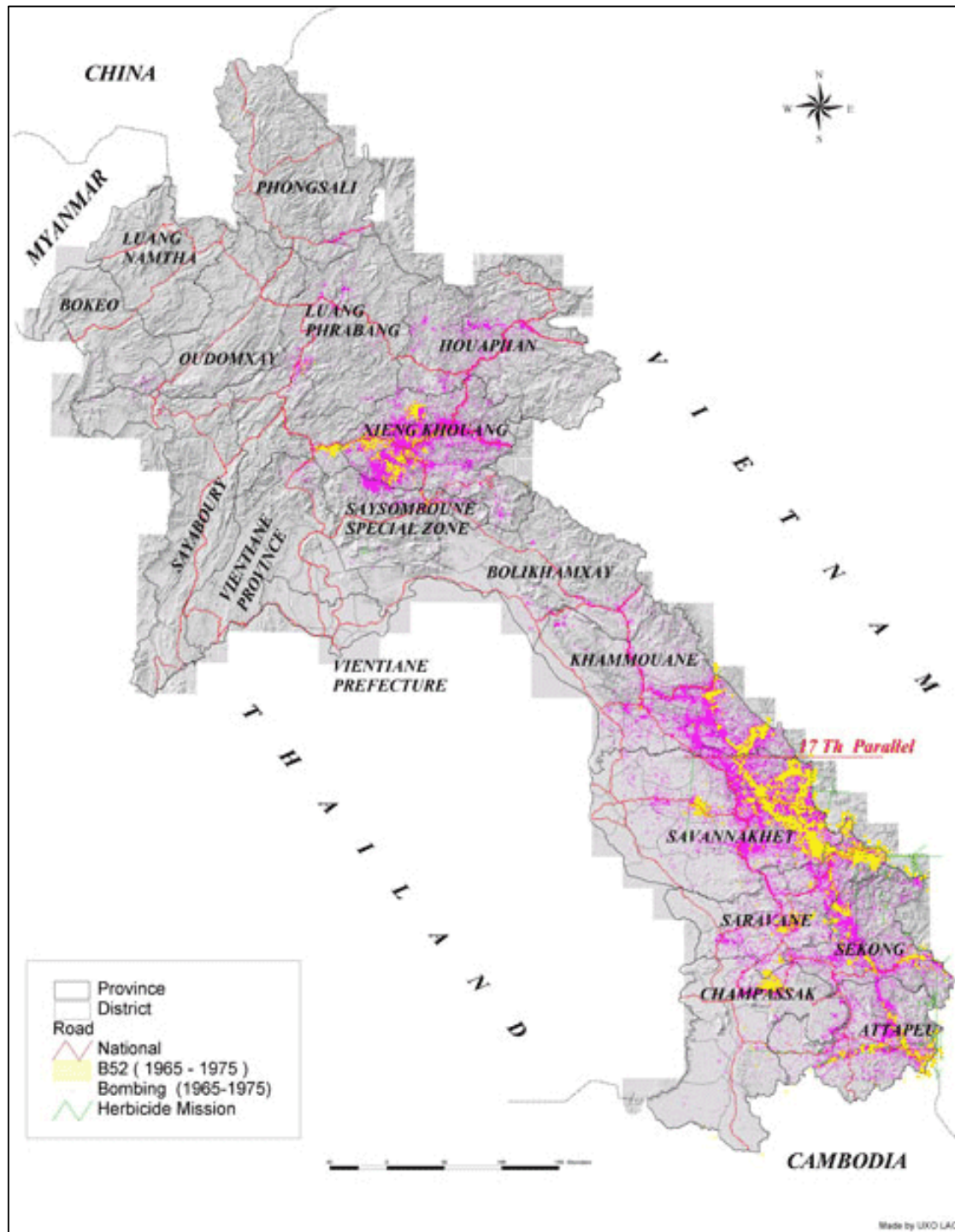


Figure 3. Latest bombing data map, downloaded from the UXO Lao website on 13 July 2008.

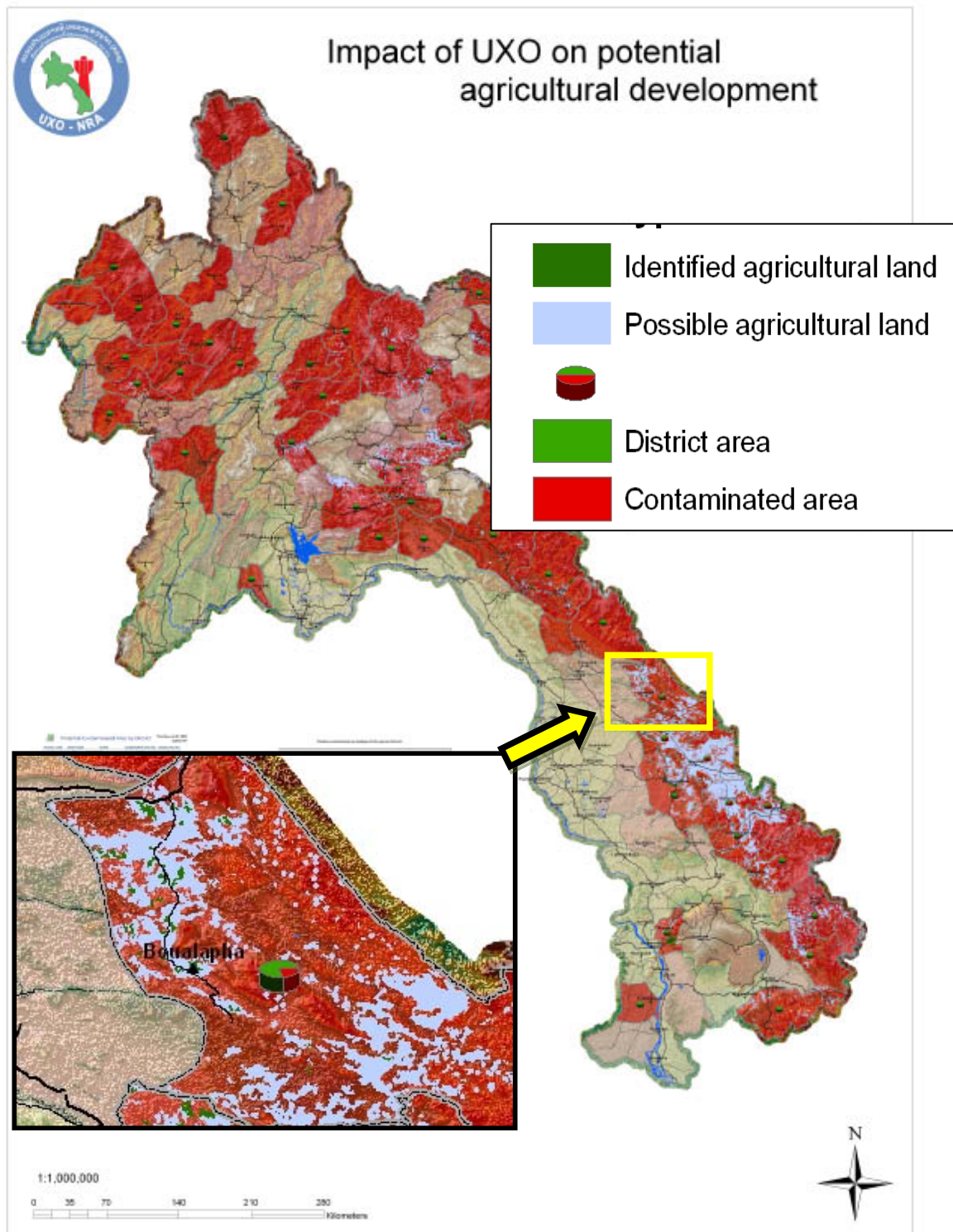


Figure 4. One of the early analytical maps developed by NRA on behalf of the Evaluation Team. The grey area represents the potential agricultural land (of all types) with potential UXO contamination, before controlling for gradient. The small pie chart in the centre of the extract shows the ratio between agricultural land (green pie slice) and contaminated land (red pie slice). Comparison with the JICA map at Figure 2 above suggests that little or any of the potential land in this section is potential paddy rice.

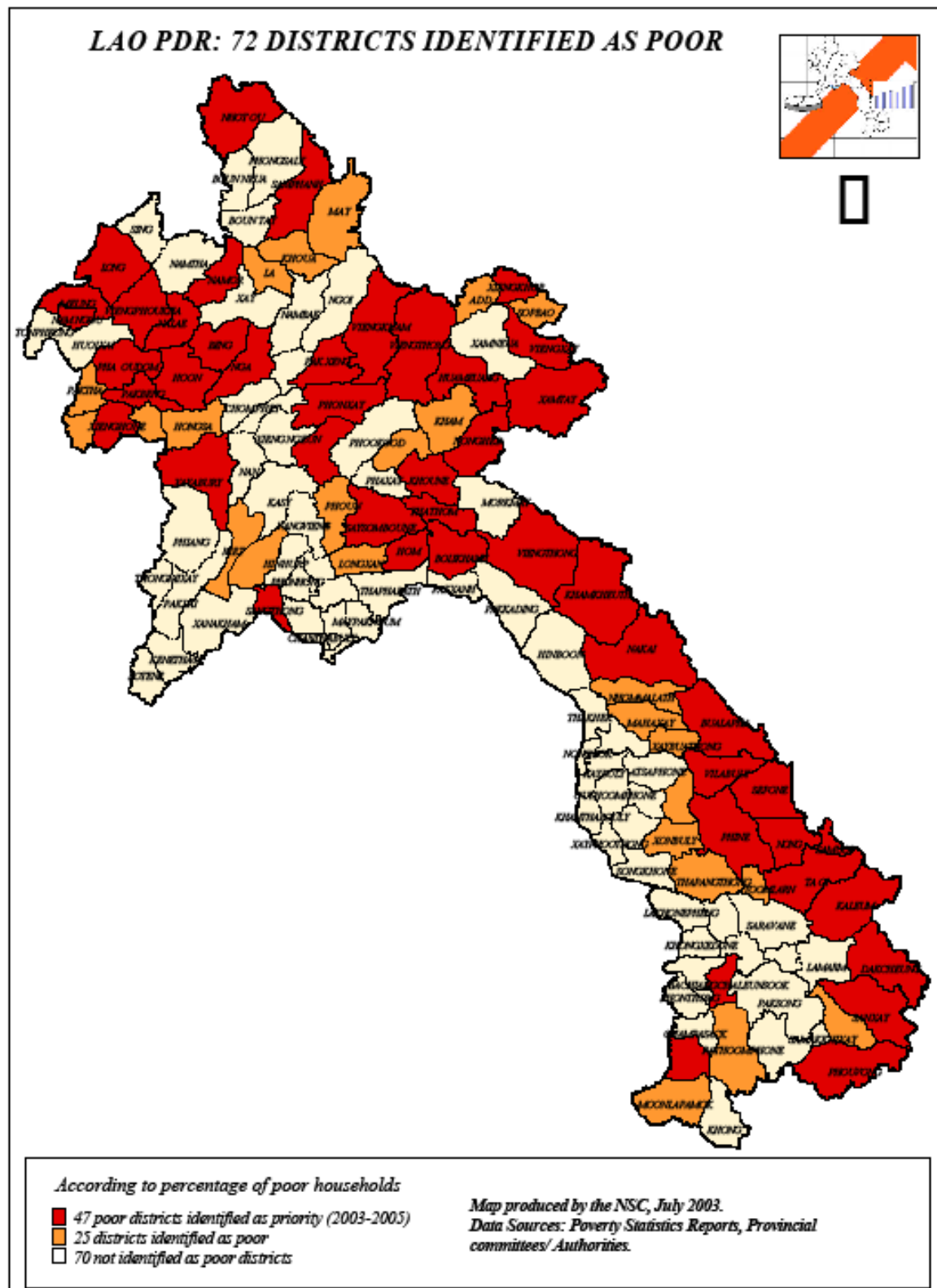


Figure 5. Map of poorest districts in Lao PDR

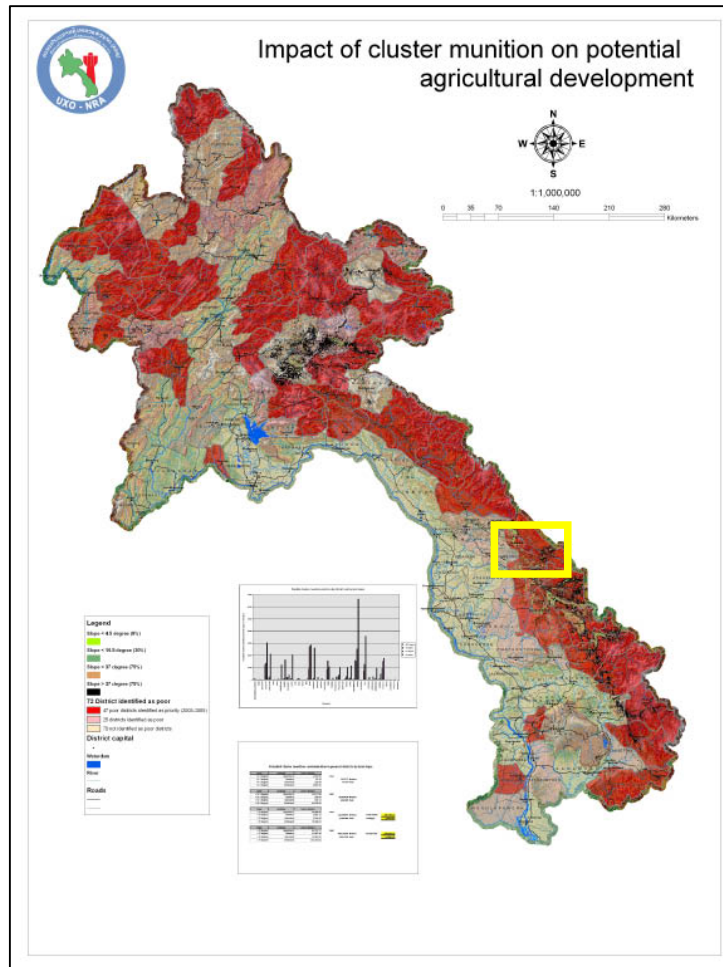
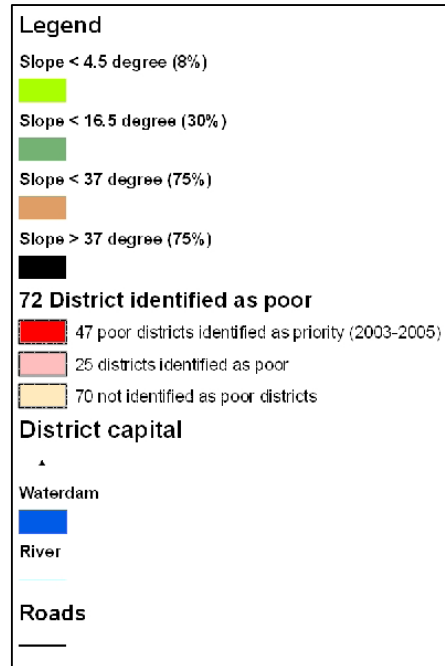


Figure 6. The completed analysis. The key to the map (left) shows how the potential agricultural land was controlled for gradient. The extract shows the same area as in Figure 4 above.



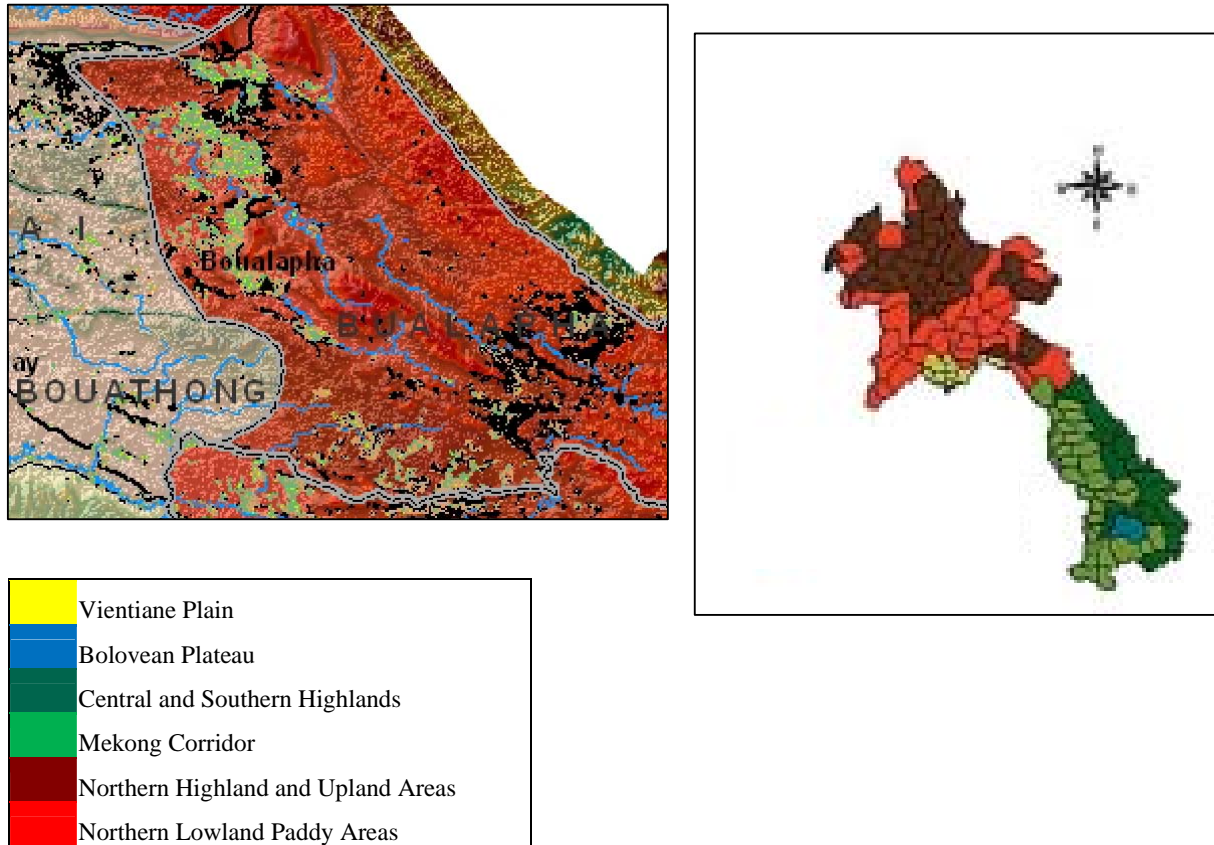


Figure 7. Map of agro-ecological zones in Lao PDR (source: FAO)

Figure 8 (below). Food security data for Lao PDR (Source: WFP). This data is used in the multicriteria analysis for UXO clearance which is summarised in Table 5 below.

Table 16: Food security status of households in rural Lao PDR

| Province | Food Consumption | | | | | | | | | Total rural HH |
|--------------|------------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|----------------|
| | Poor | | | | Borderline | | | | Acceptable | |
| | Percent of HHs | HHs | 95 percent CI | | Percent of HHs | HHs | 95 percent CI | | HHs | |
| | | | from | to | | | from | to | | |
| Phongsaly | 4 | 1,100 | 500 | 2,300 | 14 | 3,400 | 2,200 | 5,000 | 20,000 | 24,400 |
| Luangnamtha | 2 | 300 | 100 | 800 | 15 | 3,000 | 2,000 | 4,300 | 17,100 | 20,400 |
| Oudomxay | 4 | 1,400 | 700 | 3,100 | 15 | 5,200 | 3,600 | 7,300 | 29,100 | 35,800 |
| Bokeo | 11 | 2,500 | 1,400 | 4,200 | 30 | 6,700 | 5,200 | 8,400 | 12,800 | 22,000 |
| Luangprabang | 2 | 1,400 | 700 | 2,800 | 14 | 7,900 | 4,900 | 12,400 | 47,800 | 57,100 |
| Huaphanh | 2 | 600 | 200 | 1,500 | 19 | 7,200 | 4,900 | 10,400 | 29,700 | 37,600 |
| Xayabury | 1 | 600 | 100 | 2,300 | 9 | 4,200 | 2,400 | 7,000 | 42,700 | 47,500 |
| Xiengkhuang | 3 | 800 | 400 | 1,700 | 22 | 6,600 | 4,500 | 9,200 | 21,900 | 29,300 |
| Vientiane | 0 | 0 | 0 | 0 | 4 | 2,000 | 1,000 | 4,000 | 54,400 | 56,400 |
| Bolikhamxay | 1 | 200 | 0 | 1,500 | 3 | 900 | 400 | 1,900 | 26,900 | 28,000 |
| Khammuane | 1 | 400 | 100 | 1,600 | 9 | 4,100 | 2,800 | 5,900 | 43,800 | 48,400 |
| Savannakhet | 1 | 900 | 200 | 3,400 | 3 | 2,800 | 900 | 8,500 | 97,000 | 100,700 |
| Saravane | 4 | 2,000 | 900 | 4,100 | 26 | 12,600 | 9,600 | 16,100 | 33,500 | 48,100 |
| Sekong | 10 | 1,000 | 600 | 1,600 | 14 | 1,300 | 900 | 1,800 | 7,400 | 9,700 |
| Champasack | 0 | 300 | 0 | 2,300 | 1 | 1,000 | 400 | 3,000 | 83,100 | 84,500 |
| Attapeu | 1 | 200 | 100 | 600 | 8 | 1,300 | 800 | 1,900 | 14,800 | 16,300 |
| Total | 2 | 14,000 | 11,000 | 18,000 | 11 | 70,000 | 61,000 | 81,000 | 582,000 | 666,200 |

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Table 1: Potential Cluster munition contamination in poorest districts by land slope (Source: NRA)

| Slope | Landtype | Area in hectares |
|--------------|-------------|------------------|
| < 4.5 degree | Agriculture | 2,874.35 |
| < 4.5 degree | Bamboo | 85.18 |
| < 4.5 degree | Grassland | 105.20 |
| < 4.5 degree | Shrubland | 4,863.03 |

Total:

7,927.77 Hectars**79.278 Km2**

| Slope | Landtype | Area in hectares |
|---------------|-------------|------------------|
| < 16.5 degree | Agriculture | 25,477.98 |
| < 16.5 degree | Bamboo | 978.94 |
| < 16.5 degree | Grassland | 924.33 |
| < 16.5 degree | Shrubland | 42,278.42 |

Total:

69,659.68 Hectars**696.597 Km2**

| Slope | Landtype | Area in hectares |
|-------------|-------------|------------------|
| < 37 degree | Agriculture | 45,986.59 |
| < 37 degree | Bamboo | 3,682.13 |
| < 37 degree | Grassland | 2,344.10 |
| < 37 degree | Shrubland | 76,596.03 |

Total:

128,608.85 Hectars**1,286.088 Km2**

Total usable **206,196.29 Hectars**
Landtype **2,061.96 Km2**

| Slope | Landtype | Area in hectares |
|-------------|-------------|------------------|
| > 37 degree | Agriculture | 45,722.77 |
| > 37 degree | Bamboo | 11,045.49 |
| > 37 degree | Grassland | 21,993.82 |
| > 37 degree | Shrubland | 285,360.84 |

Total:

364,122.91 Hectars**3,641.229 Km2**

Grand Total **570,319.19 Hectars**
5,703.19 Km2

Table 2: Scoping Exercise Results for Options A and B**Part 1: Size**

The proportion of SHA area that is economically advantageous to release by cancellation/tech survey:

10%

The proportion of SHA area that is economically advantageous to release by clearance:

4%**Part 2: Scope**

The prioritization of the area to clear first is "Rice", followed in order by "Upland Rice" and "Livestock"

| | Area, by Crop Type | | | | | Total | Percent of all SHAs |
|---|--------------------|-------------------------------|-------------|------------|----------|------------|---------------------|
| | Rice Paddy | Upland rice with Cancellation | Upland Rice | Livestock | Mountain | | |
| Estimate of total land (Ha) | 7,928 | 69,660 | 69,660 | 128,609 | 364,123 | 570,319 | 100% |
| Portion useful land contaminated (Ha) | 7,928 | 69,660 | 69,660 | 128,609 | | 206,196 | 36% |
| Portion to be released by clearance (%) | 100% | 20% | 100% | 0% | 0% | | |
| Portion to be released by clearance (Ha) | 7,928 | 13,932 | 69,660 | | | | |
| Cost to clear | 30,630,008 | | 269,139,654 | | | 77,587 | Ha |
| Portion to be released by cancellation (%) | - | 80% | 0% | | | 21,860 | Ha |
| Portion to be released by cancellation (Ha) | - | 55,728 | - | | | | |
| Cost to clear and cancel | - | 107,655,862 | - | | | | |
| Years required | 4 | 7 | 31 | | | | |
| Re-occurring annual benefit from land | 4,646,040 | 15,551,927 | 15,551,927 | 19,897,882 | | 40,095,850 | |
| Years to re-coup clearance costs | 9 | 10 | 38 | 71 | | | |

Notes:

* Livestock: Assuming at least 9 goats per hectare.

- Calculations are based on data to-date from NRA

** Mountain = slope greater than 37 degrees

--Recouping cost depends on discounted value. See spreadsheet for details

| | | | |
|--------------------|---------------------|-------------|--|
| Total cost | Option A (35 Years) | 299,769,662 | Clear Paddy and Upland Clear Paddy and 20% Upland, release 80% upland |
| | Option B (16 Years) | 138,285,870 | |
| Annual Cost | Option A | 8,564,847 | |
| | Option B | 12,571,443 | |

Table 3: Scoping Exercise Results for Options C and D**Part 1: Size**

The proportion of SHA area that is economically advantageous to release by cancellation/tech survey:

4%

The proportion of SHA area that is economically advantageous to release by clearance:

2%**Part 2: Scope**

The prioritization of the area to clear first is "Rice", followed in order by "Upland Rice" and "Livestock"

| | Area, by Crop Type | | | | | Total | Percent of SHAs |
|---|--------------------|-------------------------------|-------------|------------|----------|------------|-----------------|
| | Rice Paddy | Upland rice with Cancellation | Upland Rice | Livestock | Mountain | | |
| Estimate of total land (Ha) | 7,928 | 25,478 | 25,478 | 128,609 | 364,123 | 526,137 | 92% |
| Portion useful land contaminated (Ha) | 7,928 | 25,478 | 25,478 | 128,609 | | 162,015 | 31% |
| Portion to be released by clearance (%) | 100% | 20% | 100% | 0% | 0% | | |
| Portion to be released by clearance (Ha) | 7,928 | 5,096 | 25,478 | | | | |
| Cost to clear | 30,630,008 | | 98,437,650 | | | | |
| Portion to be released by cancellation (%) | - | 80% | 0% | | | | |
| Portion to be released by cancellation (Ha) | - | 20,382 | - | | | | |
| Cost to clear and cancel | - | 39,375,060 | - | | | | |
| Years required | 4 | 3 | 12 | | | | |
| Re-occurring annual benefit from land | 4,646,040 | 5,688,107 | 5,688,107 | 19,897,882 | | 30,232,029 | |
| Years to re-coup clearance costs | 8 | 8 | 32 | 71 | | | |

| | | |
|----------|-------|--------|
| Option C | Years | 16 |
| Option D | Years | 7 |
| Option C | Area | 33,406 |
| Option D | Area | 13,023 |

Notes:

| | | | |
|-------------|----------|-------------|--|
| Total cost | Option C | 129,067,658 | Clear Paddy and Upland |
| | Option D | 70,005,068 | Clear Paddy and 20% Upland, release 80% upland |
| Annual Cost | Option C | 8,066,729 | Clear Paddy and Upland |
| | Option D | 10,000,724 | Clear Paddy and 20% Upland, release 80% upland |

* Livestock: Assuming at least 9 goats per hectare.

- Calculations are based on data to-date from NRA

** Mountain = slope greater than 37 degrees

Table 4: Summary of findings from CBA

| Ser | Option | Definition | Area (Ha) | Cost | | Time Required | Remarks |
|-----|----------|--|-----------|------------|-------------|---------------|--|
| | | | | Annual | Total | | |
| (a) | (b) | (c) | (d) | (e) | (f) | (g) | (i) |
| 1 | Option A | Clearance of all potential Paddy and all potential Upland Rice | 77,587 | 8,564,847 | 299,769,662 | 35 | |
| 2 | Option B | Clearance of all potential Paddy and 20% of all potential Upland Rice, with the remaining 80% of potential upland rice being released by technical survey | 21,860 | 12,571,443 | 138,285,870 | 16 | 55,728 Ha of Upland rice area also released by cancellation. |
| 3 | Option C | Clearance of all potential Paddy and highest quality potential Upland Rice | 33,406 | 8,066,729 | 129,067,658 | 16 | |
| 4 | Option D | Clearance of all potential Paddy and 20% of highest quality potential Upland Rice, with the remaining 80% of potential high quality upland rice being released by technical survey | 13,023 | 10,000,724 | 70,005,068 | 7 | 20,382 Ha of Upland rice area also released by cancellation |

Note: assumptions in the modeling include:

- The availability of 26 area clearance teams
- Each clearance team is able to clear 8 Ha/month, working over an 11 month year
- The total cost of each square metre is \$0.38/m2, based on full accounting using the MMAC Model version 1.3 (a copy of this model is available from the Evaluation Team).

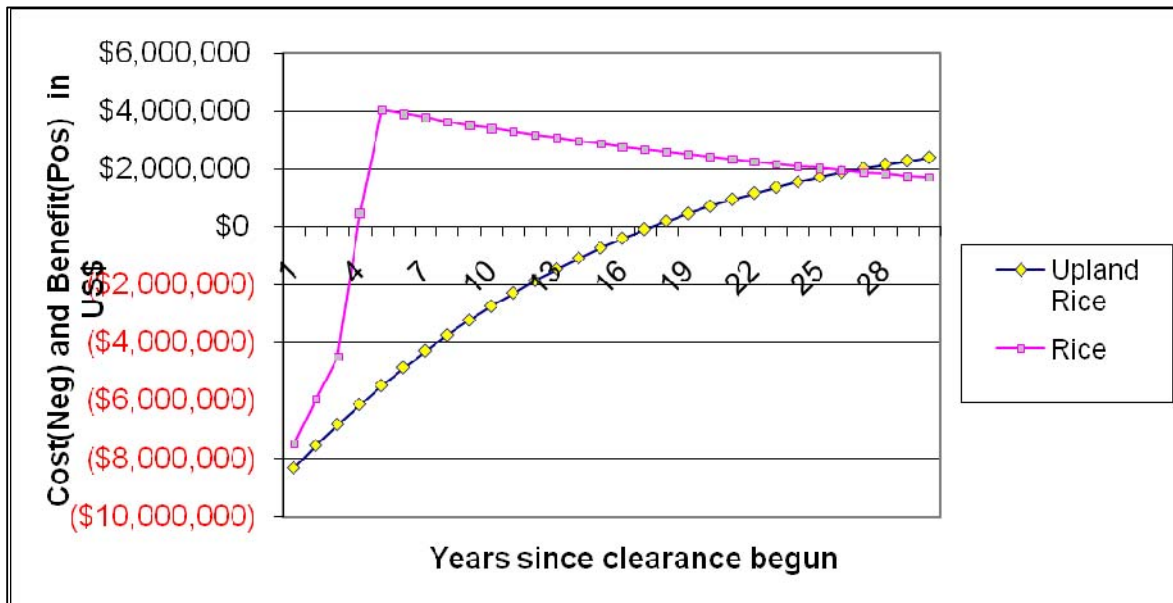


Figure 9. Net Present Value of rice crops grown on cleared land, using a discount rate of 3.5%. Both crops accrue a positive NPV. Paddy is almost commercially viable¹⁰, though note the far smaller area for paddy rice



Figure 10. Net Present Value of rice crops grown on cleared land, using a discount rate of 10%. Note that Upland Rice never accrues a positive NPV.

¹⁰ “Commercially viable” in that the rate of return (with these assumptions) is *almost* high enough to permit commercial profits to be made even if the full cost of clearance were borne by the beneficiary



Figure 11. This piece of land being cleared by HIB is likely to be suitable for upland rice production.

Conclusions

The CBA reinforces the premise that the clearance of the most valuable land in Laos is worthwhile from an economic perspective, and, as in the earlier evaluation in 2002, it is possible to differentiate between which type of land is worth clearing and that which is not worthwhile. A decision needs to be made on what proportion of upland cultivation areas should be cleared. Table 4 above provides an idea of the range of options in terms of area, length and budget. It seems appropriate to set a target to clear all potential paddy area and then survey upland areas. This could take around 16 years at current resource levels. If the number of area clearance teams is increased from 26 to 30, completion is possible in 10 years.

The CBA is very sensitive to changes in data, in particular to productivity of the area clearance. While there has been a steady increase in productivity in the years since 2002, but the sensitivity of the CBA model to productivity also suggests there is a continued value in seeking other methods of improving efficiency.

The model is also sensitive to the prices and yields of the agricultural output. However, it is comparatively insensitive to price/m² of clearance. The model clearance price had to be reduced by some 40% in order to show upland rice making a positive return at a 10% discount rate.

The CBA shows there is a potential role for a credible technical survey process that is able to quickly release land without subjecting it to full clearance. The question of establishing a credible survey process is considered again in the section of this report on UXO Lao.

The 'hump' concept

The diagram in Figure 12 below shows how the different requirements could be combined in an overall program. The key elements are described below:

1. Training and equipping phase for a sustainable capacity to deal with residual contamination, built and operated with donor support
2. Continued operation of the sustainable residual capacity using Laotian resources
3. One of a number of different mine action projects (UXO Lao and other operators) operated in the mid term with donor support.
4. The 'hump' defines the total requirement of the program in terms of overall resources, based on an objective scoping exercise (such as the one carried out above).
5. The point at which donor funding ceases. This is the basis for an 'exit strategy' for international assistance.
6. Pre-cursor activities necessary to establish the hump concept.

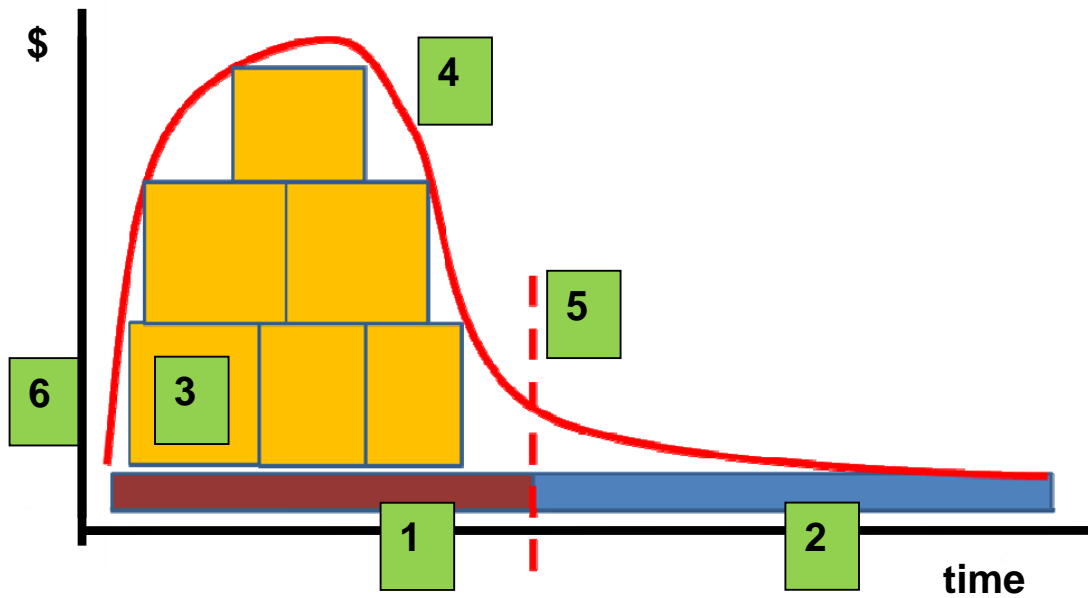


Figure 12. The 'hump' concept shows how different projects can be combined to deal with mid-term needs plus the establishment of a sustainable capacity to deal with residual contamination in the longer term.



Figure 13. The widespread use of cluster bomb unit canisters is an indication of how much bombing took place

4. UXO Sector Performance: Findings and Conclusions

Evaluation Objective #1: Evaluate progress of the UXO Sector against the three objectives of the National Strategic Plan. Also examine the National Strategic Plan and make recommendations for revisions¹¹.

Significant Recent Events in the Sector

Significant events in the UXO sector since the National Strategic Plan was approved in 2004 include the following:

- NRA-UXO Lao separation. The NRA and UXO Lao are now two separate entities. NRA has been set up as the regulatory authority and UXO Lao as the national UXO clearance programme.
- Expanded participation of commercials and NGO clearance operators. There are now three commercial firms doing UXO clearance and 3 NGOs.
- Draft national standards. National standards for UXO clearance have been adapted from international standards for Lao PDR. Approval of the draft standards by the NRA is expected by the end of the year.
- Rapid expansion of land clearance for agriculture and development. In the last few years, land intensive development activities have greatly increased. These activities include mining projects, hydropower projects and plantation crops in agriculture. Many of these projects are ongoing or planned in contaminated areas.
- Expansion of scrap metal collection. Scrap collection based on bomb and munitions fragments has also expanded rapidly as a result of the dramatic increase in construction spending. Scrap is reprocessed into re-enforcing bars for concrete buildings. Scrap collectors are taking calculated risks in collecting scrap in areas where there is UXO contamination.

Existing Composition of the Sector

The sector is comprised of the following institutions and organizations at present:

Regulation of the Sector

National Regulatory Authority (NRA)

Community Awareness Organizations

Ministry of Education

UXO Lao

Handicap International Belgium

World Vision

UNICEF

Lao Youth Union

World Education

Clearance Operators

¹¹ Recommendations for the Strategic Plan will be proposed in Chapter 7.

UXO Lao
 Ministry of Defense
 Mine Advisory Group (MAG)
 Handicap International Belgium (HIB)
 Swiss Foundation for Mine Action (FSD)
 Milsearch
 Bactec
 Phoenix Clearance Ltd. (PCL)

Victim Assistance

Ministry of Health
 Ministry of Social Welfare
 Handicap International Belgium
 Association for Aid & Relief
 COPE
 Lao Disabled Persons Association
 World Education Consortium

Expenditures in the Sector (2007)

The following table provides the approximate annual expenditure for the UXO Sector¹²:

| Expenditures Reported to NRA by UXO Operators (2007) | |
|---|----------------------------|
| Organization | Expenditures (\$US) |
| NRA | 830,827 |
| UXO Lao | 5,984,829 |
| Mine Advisory Group | 4,587,974 |
| Handicap International Belgium | 459,698 |
| Swiss Foundation for Mine Action (FSD) | 1,023,393 |
| World Education Consortium | 299,500 |
| Association for Aid & Relief | Est. 5,445 |
| COPE | 465,900 |
| Phoenix Clearance Ltd | Est. 600,000 |
| Milsearch & Bactec for Oxiana | 4,013,464 |
| Total | Est. 18,271,030 |

Strategic Plan Objectives

The National Strategy Plan for the UXO Programme in Laos, “The Safe Path Forward”¹³ sets out three objectives:

- a. Community Awareness: “UXO/Mine Risk Education (MRE) teams will visit and deliver MRE training to all impacted communities in Lao PDR (as identified in the 1997 National Impact Survey), and UXO/mine accidents will be reduced to a national accident rate not exceeding 100 persons/year”;

¹² UXO Sector Annual Report 2007, NRA, p.12

¹³ Prime Minister’s Office, Resolution of the Lao PDR Government, 29 April 2004, Ref 01/pm

b. Survey and Clearance: “All agricultural areas considered to be ‘high priority’ will be cleared, as well as a sizeable portion of other areas identified as ‘medium priority’ – for a total of no less than 18,000 hectares (180 square km) of land cleared by UXO Lao alone”;

c. Victim Assistance: “A national database on Mine/UXO accidents (covering all 18 provinces) will be developed and updated regularly, to feed into the prioritisation of clearance and MRE tasks. The specific needs of survivors of UXO/mine accidents, in terms of both physical rehabilitation and socio-economic integration, will be factored in all national/local public health initiatives”;

Findings: Community Awareness

Research Findings

While no sector-wide evaluations of community awareness activities have been carried out during the last few years, three useful studies have been completed. The first study, “An Evaluation of UNICEF-supported UXO Risk Education Project in Lao PDR” was carried out by the Geneva International Centre for Humanitarian Demining (GICHD) and published in October 2005. Among its main conclusions were:

- “There are clearly...limits to what education on its own can provide to those at risk....This means that the integration of risk education into broader UXO action as well as into development is all the more critical.”¹⁴
- “There is little evidence to support the conclusion that the projects have significantly reduced casualties from UXO in areas of project implementation”¹⁵.
- “In terms of sustainability, it is highly likely that many of the teachers trained by the Consortium and provincial departments of education will continue to apply their acquired skills even after the project has ended”.¹⁶
- “... a thorough national assessment of needs (for risk education) should be carried out in Lao PDR as soon as possible”.¹⁷

The Mines Advisory Group (MAG) carried out the “UXO Risk Education Needs Assessment” – as recommended above - in 2006 with funding from AusAID. This study conducted a KAP (knowledge, attitude and practice) survey of 1712 adults and 720 children in five provinces. The study report “found overall a high level of awareness and understanding among both adults and children and the risks associated with coming into contact with UXO....82% of the adult respondents indicated that no UXO is safe...Of the children, 99.6% considered UXO to be dangerous and 97% reported being afraid of UXO.”¹⁸ The report continues: “nevertheless, despite known risks many people, on an almost daily basis, continue to interact with live or potentially live ordnance.” Further, “intentional UXO risk taking was found to be based on a rational decision making process involving weighing up of the potential costs and benefits of a range of available livelihood options.” “The most common ways in which people voluntarily expose themselves to UXO risk is through collecting or dealing in scrap metal, moving UXO from farmland and dismantling UXO.” The study identified the high risk groups as 1) adults and children who collect scrap metal, 2) adults and children who work agricultural land and move UXO out of farm land, 3) scrap

¹⁴ An Evaluation of UNICEF-supported UXO Risk Education Project in Lao PDR, GICHD, October 2005, p.3

¹⁵ *ibid.*, p 4.

¹⁶ *ibid.*, p 5.

¹⁷ *ibid.*, p. 5.

¹⁸ UXO Risk Education Needs Assessment, MAG, October 2006, p. 7.

metal dealers, 4) adults who dismantle UXO, and 5) children who play with UXO. In regard to UXO found on farm land, the report quotes a farmer whose views apparently were shared by many of the interviewees: “No clearance team comes and helps us so even though it is not safe to move, when we find UXO...we need to move them. Otherwise the following (planting season) we don’t know where they are”.¹⁹

The third study, carried out by the GICHD with funding from UNDP confirmed the finding of the MAG study about intentional interaction with UXO: “the majority of the recorded findings appear to be the result of accidents when victims were knowingly carrying out hazardous activities...” Furthermore, this study noted that “with respect to UXO risk education, ...Community Awareness seemed largely to target unintentional risk-taking and not necessarily among the highest risks groups.”²⁰

Scrap Metal Collection

The scrap metal trade is a central area of “intentional interaction with UXO”. There has been no comprehensive study of the scrap metal trade to date. A survey carried out by GICHD with funding from AusAID and UNICEF in 2005²¹ gathered a good deal of information about how the trade is carried out, but did not generate any basic data on the order of magnitude of the trade, numbers of participants or price movements over time. The survey noted serious problems with the data on UXO accidents but nevertheless did infer that scrap metal collection is closely associated with UXO accidents particularly among children who often participate in scrap collection. Various provincial governments have attempted to prohibit or limit the scrap trade by, for example, outlawing metal detectors.

Preliminary data gathered by UNIDO from a large scrap metal dealer includes the following:

- There are 16 foundries in Laos that process scrap metal. Re-enforcing bar (rebar) for construction is a major product of these foundries. Fragments from bombs and other munitions are major components of scrap.
- Scrap processors often unwittingly take in UXO with scrap. Some factories will not accept UXO if they recognize them.
- The price of scrap at the village level has risen from 500 kip per kilogram in 2002 to 2200-2500 kip per kilogram today. At the factory gate, the price may be as high as 3800 kip per kilo.
- Scrap collection is well organized. Factories have networks of collectors and may provide metal detectors, transport and credit to collectors. Scrap collection occurs year round, but mainly during the dry season when farmers are not occupied with their crops and access to remote areas is easier.
- The conversion of scrap to rebar is highly profitable indicating that the demand for scrap is likely to continue to remain strong – as will the assumption of calculated risk of UXO accidents on the part of scrap collectors.

Expanded Land Use for Agriculture

Another area of “intentional interaction with UXO” is land clearing for agriculture development and the subsequent farming of the land. The land may be contaminated and may never have been cleared of UXO. The extent of such land clearing for agriculture is

¹⁹ Ibid., p.8-10.

²⁰ Lao PDR Risk Education Management and Mitigation Model, GICHD, February 2007, p. 42.

²¹ A Study of Scrap Metal Collection in Lao PDR, GICHD, September 2005

unknown, but the evaluation team observed that it appears to be widespread both for plantation agriculture and small farms. Farmer contact with UXO may be incidental – when a farmer encounters a UXO during land clearing or cultivation - or intentional when the farmer decides to move a UXO that he has uncovered. Similarly, UXO clearance teams have reported that when farmers burn brush on land being opened for agriculture, there are often detonations of subsurface UXO under the fires.

UXO Risk Education Activities.

The Sub-sector Working Group on Risk Education has produced a strategic plan (2007-2010) for risk education operators to guide their efforts. The plan emphasizes targeting risk education on high risk areas and high risk groups and developing sustainable programmes by integrating them into Government plans priorities and budgets.

At present, the operators are implementing various education strategies within their areas of specialization. UXO Lao is perhaps the largest sponsor of risk education activities. Its activities have been ongoing since 1996. Its approach uses provincial community awareness teams to conduct intensive awareness campaigns on a village by village basis. Under this approach, a community awareness team visits one village per week for four days for a series of group and family educational activities including puppet shows, songs, dances and games. The fifth day of the week is for preparing a report at the provincial UXO Lao office. UXO Lao has been carrying out this approach to community awareness since 1996. Through 2007, community awareness teams had visited 6,659 villages reaching over 1.7 million people.

The World Education Consortium and the Ministry of Education have developed and implemented a UXO risk education programme in primary schools in most of the districts in nine provinces. The programme includes teaching materials, posters, handbooks, guidelines for teachers, and teacher training. The Ministry has assumed responsibility for the continuation of the programme and its expansion into additional provinces and districts.



Figure 14. The HIB parenting module for risk education being tested in Savannakhet.

Findings: Victim Assistance

The work on the UXO victim database got underway at the NRA in October 2006. The database will be a reconstructed historical database for all known UXO accidents. The work that has been completed includes:

- Decisions on the information to be collected;
- Design and pre-testing of the data collection tool;
- Establishment of a network for data collection through the National Rehabilitation Center;
- Hiring and training of 119 enumerators and 20 supervisors;
- Collection and validation of survey form content (ongoing);
- Data entry (ongoing);
- Preliminary data analysis (ongoing).

The expected date for completion of the backlog of data entry is December 2008 at which time the database will be up to date and fully operational.

Once the historical data collection has been completed, continuing collection of new accident information should require only a few, perhaps 7, enumerators. Accident data entry will be a part time job of the NRA data processing unit.

Preliminary analysis of data that has already been entered suggests the following tentative conclusions:

- Using a projection based on data already entered in the database from the historical survey, UXO victims in the past decade have averaged 300 per annum²². The number of accidents per year over the past decade has fluctuated but has exhibited no trend or pattern. In other words, the number of victims is triple the number recorded by UXO Lao and has not been declining.
- The survival rate from UXO accidents has risen from 50% ten years ago to around 65% today. In other words, deaths from UXO accidents have declined from an estimated 150 per annum to an estimated 105 per annum today²³.

In regard to the mainstreaming of physical rehabilitation services for UXO victims, the Ministry of Health now operates five rehabilitation facilities nationwide. The Ministry of Health has direct responsibility for the main facility, the National Rehabilitation Center, in Vientiane. The other four are managed by the provincial Departments of Health where they are located. The Ministry of Social Welfare also operates a center that provides limited services at Ban Keun in Vientiane province. According to the Ministry of Social Welfare, there are over 100 centers around the country under various ministries and departments that provide vocational training. These centers are open to all including the disabled. No psycho-socio counseling for UXO victims is available from Government facilities.

Emergency care and continuing hospital care for UXO victims, as opposed to rehabilitation services, are at the same standard as other medical services available to all accident victims,

²² Noting that data was incomplete, UXO Lao reported 90 UXO victims in 2007. Of these, 29 died and 61 were injured.

²³ In order to put UXO accidents in perspective as a health care issue, road accidents nation-wide were over 4,600 in 2005, increasing to nearly 5,200 in 2007. Deaths from road accidents were 414 in 2005 and 608 in 2007. See Annex 6.

regardless of cause. However, it is noteworthy that UXO victims, in contrast to victims of other kinds of accidents, tend to be in remote rural areas that may be some distance from emergency and continuing care facilities.

Achievement of Objectives in the National Strategic Plan for Community Awareness and Victims Assistance

In regard to the achievement of National Strategic Plan Objectives, the mission concludes as follows:

- Given that UXO Lao alone has conducted community awareness activities in 6,659 villages over the last ten years and that other operators also conduct risk education activities, it is likely that community awareness activities have reached the 2,861 villages identified in the National Impact Survey of 1997. However, there has not been any check off process to ensure that the villages where community awareness activities are conducted are indeed on the list of impacted villages.
- The NRA office currently estimates the number of UXO victims at 300 per year, far above the target of 100 persons per year. It should be noted, however, that the target in the Strategic Plan was set without the benefit of a credible accident and victim data baseline. As data has become available, it has become clear that the target in the Plan was unrealistic.
- The national database on UXO accidents, including historical data, should be fully operational by year-end.
- The needs of survivors of UXO accidents are incorporated into national and local public health, social welfare and vocational education initiatives. The concerned Government organizations accept full responsibility for the needs of survivors and do not discriminate against victims on the basis of cause of accident in the provision of health and social services.

Other Conclusions Regarding Community Awareness and Victim Assistance

Relevance

- It would appear that community awareness activities reach many villages that are outside the 1997 national survey results that identified 2,861 villages that were impacted by UXO. UXO Lao alone has conducted community awareness in 6,659 villages. The community awareness campaigns are of marginal relevance to non-impacted villages.

Efficiency

- In general, the evaluation mission found additional support the conclusions of research on community awareness and risk education that basic knowledge of UXO and UXO risks is widespread and that general education efforts are likely to be yielding diminishing returns.

Effectiveness

- Government agencies and officials that should be concerned with UXO issues are insufficiently informed in regard to policies in the sector and NRA functions.

- Expectations about the extent to which education or awareness raising can alter behavior are unrealistic, especially given the potential benefits of calculated risk taking in regard to handling UXOs.
- Scrap metal collection is a risky line of work, like many others, but on balance the rewards of immediate cash income outweigh the risks in the eyes of scrap collectors. With the exception of plans being developed by MAG in Xieng Khouang province, no efforts are underway to develop targeted strategies for working with the scrap trade to reduce UXO accidents. Similarly, no targeted efforts to prevent accidents in the course of agricultural land clearing have been identified.

Findings: UXO Clearance Activities in the Sector

Area clearance

The Evaluation Team notes that the “Safe Path Forward” makes reference to clearance of agricultural land, clearance of infrastructure, and clearance of other development projects. The Team concurs with these as selections of project types that are ‘relevant’ under OECD definitions, but feels that more could be done to rank these categories.

The Evaluation Team understands the requirement for UXO clearance in terms of the following definitions and ranking for categories of area clearance tasks carried out using aid money:

- Public development projects that are funded by international development organizations (e.g. the World Bank)
- Public development projects that are funded by resources available to the Province or District (such as, the Poverty Reduction Fund, the District Development Fund or Government resources)
- Public clearance tasks that affect communities as a whole but that are not linked to development projects (e.g. the clearance of an existing school yard that is thought to be contaminated by UXO)
- Clearance of private land for agricultural development by families or individuals, commensurate with their ability to develop and utilize it

The reason for this suggested ranking is to do with the overall utility of these categories of projects. A large infrastructure project is likely to have more impact on the economic development of Lao PDR (and hence more relevance to poverty reduction for the population as a whole) than the clearance of a single household’s agricultural land, and indeed the internal rate of return (IRR) of a single hectare destined for a development project is almost certainly going to be larger than the IRR of a single hectare intended for agricultural use, even in the most productive regions. Furthermore, given that most of the UXO contamination is in the parts of Lao PDR that are, by various measures, ecologically the most poor, there is very little potential high value agricultural land that is likely to be contaminated by UXO.

However, the ranking of these categories is only one way to look at them. Perhaps a more interesting question is the best way by which clearance within these categories is (or should be) funded. This is discussed in the section on ‘Impact’ below.

Spot tasks and roving teams

The “Safe Path Forward” does not, however, address the issue of ‘spot’ tasks at all in terms of setting targets²⁴, although all of the clearance agencies operate ‘roving’ teams able to deal with such tasks. The Evaluation Team believes that the absence of performance targets for spot tasks means that the importance of such isolated UXO in terms of the hazard that they pose is under-valued. The section of this report that deals with UXO Lao includes some specific advice on how performance criteria could be used to establish the size of a roving team requirement and on how to measure their efficiency.

Impact

The types of clearance projects and their impact on development and poverty reduction are set out below.

- Public development projects funded by international development organizations. These tend to be larger development projects with an emphasis on development rather than directly on poverty reduction. Where it is thought necessary, UXO clearance is funded on a contractual basis. Work tends to be carried out by commercial UXO clearance agencies. The Evaluation Team agrees this is the most appropriate approach for clearance but would suggest that a number of principles should be enshrined in suitable regulations to ensure the appropriate level of quality. These principles are included in the Recommendations below.
- Public development projects funded by resources available to Provinces or Districts. These tend to be smaller development projects, with some emphasis on poverty reduction (though not targeted at individual households). UXO clearance tends to be made available on an *ad hoc* basis (or otherwise not done at all) by UXO Lao or NGOs, without any payment being made for the clearance services. The Evaluation Team believes that this current process is problematic in terms of relevance and impact in that the development projects cannot be sure that they will get clearance support in a timely manner. The Evaluation Team notes the important new initiatives put in place by AusAID to make resources available for development agencies to become customers of UXO clearance rather than supplicants.
- Public clearance tasks. At present, such tasks are conducted by UXO Lao as part of their annual works plan or by the NGO in the areas where they work, again without payment. There is no potential to pay for such projects because there is no development funding attached, but the projects tend to affect larger numbers of people compared to the clearance of agricultural land.
- Clearance of agricultural land. The clearance of agricultural land has perhaps the largest direct relationship to poverty reduction strategies on behalf of the individual beneficiaries, but it is a comparatively weak connection to a national poverty reduction strategy. Furthermore, it is unlikely that the beneficiary households would be the ‘poorest of the poor’ as such people would be unlikely to be able to farm (additional) land even if it was cleared on their behalf. The poorest are only likely to benefit where they are subsequently hired as farm laborers to work this agricultural land. Furthermore, as noted above, there is

²⁴ ‘Spot’ tasks are isolated UXO that are reported to clearance agencies by members of the community. The response normally consists of a mobile team that either demolishes the item *in situ* or takes it away for demolition elsewhere if it is safe to do so.

comparatively little potential high value agricultural land in the contaminated areas. Clearance of such land is done on an unfunded basis by UXO Lao and by NGOs where their projects require it, and is free at the point of delivery (i.e. the beneficiary does not pay for the clearance). The scoping exercise suggests that the clearance of such land is unlikely to ever make a commercial return, though it shows a positive benefit when examined from a welfare economics perspective. Even where it is a positive benefit, it only benefits the households to which the land is allocated, so when considering questions of equity, public clearance tasks appear to be a higher priority.

To summarize, this definition of development projects requiring UXO clearance can be divided into two classes:

- Clearance in support of development projects, where the clearance is funded as a line item in the development project budget.
- Clearance of areas as ‘a public service’ where either large numbers of individuals are potentially at risk from UXO (and there is no associated development project) or where individual households will benefit. In both cases the service is to be free at the point of delivery. The Evaluation Team notes that this is the area where UXO Lao is mainly active at present. The implications for UXO Lao of tendering for funded projects are discussed in more detail in Chapter 5.

Resource allocation

If the suggested paradigm for scoping the problem is accepted, and the categories of area clearance tasks are agreed, then a resource allocation model can be considered. The multi-criteria analysis (MCA) spreadsheets made available to the NRA and UNDP set out a possible way by which the section of “The Safe Path Forwards” dealing with the allocation of UXO Lao teams can be revisited to allocate resources on a transparent, objective and equitable basis²⁵. This process includes analysis of spatial data (contaminated areas and areas of provinces), demographic data (population size), numbers of impacted villages, and vulnerability in terms of food security. The results are summarised in Table 5 below. These results could change if different ‘weighting’ (i.e. emphasis) is placed on particular criteria.

| Table 5: Possible resource allocation results | | |
|--|------------------|----------------------|
| Province | EOD Roving Teams | Area Clearance Teams |
| Luangprabang | 3 | 1 |
| Huapanh | 2 | 1 |
| Xiengkhuang | 7 | 3 |
| Khammuane | 2 | 3 |
| Savannakhet | 4 | 10 |
| Saravane | 3 | 3 |
| Sekong | 1 | 1 |
| Champasack | 2 | 1 |
| Attapeu | 2 | 1 |
| TOTAL | 27 | 24 |

²⁵ See <http://maic.jmu.edu/JOURNAL/7.1/focus/keeley/keeley.htm> and also http://www.sac-na.org/res_pubs_EDSTools.html

Prioritization

If the four categories of area clearance tasks set out above are accepted, then it would be possible to prioritize all (except for the clearance of agricultural land) in terms of the net benefit of the development project.

This prioritization system is not possible for the clearance of individual plots of agricultural land. However, other processes could be adopted. These could include the use of a rationing system or a lottery system. In order for either of these to work effectively, then it would be necessary to collate all of the known outstanding potential clearance tasks at a district level. The current prioritization process would appear to operate an informal ‘screening’ process in which district administrations and UXO Lao work together to compile a list of tasks for the year that closely fits with UXO Lao’s own work quota in that district, thus not allowing a full ranking process to take place. This method also has implications for UXO Lao’s new Enhanced Technical Survey (ETS) process. The current UXO Lao prioritization process and the new ETS process are discussed in more detail in Chapter 5.

One thing that *is* clear to the Evaluation Team is that there is no need for the prioritization process to be conducted in detail in Vientiane. The Evaluation Team finds that the detailed involvement of UXO Lao and the various supervisory bodies (including the NRA, the NRA office and the Ministry of Labor and Social Welfare) are contributing to the inflexibility of the current planning process by the time taken to scrutinize the UXO Lao work plans in detail. This is a case where there is too much oversight. As a result it is hard for other development projects or requests for assistance to get their case heard by UXO Lao in a timely manner.

Effectiveness**National Standards**

The development of the National Standards for UXO clearance by the NRA office should contribute greatly to the effectiveness in UXO clearance by setting a quality benchmark, although the Evaluation Team notes that the National Standards are still in draft form. The NRA itself is covered in more detail in Chapter 4.

The quality assurance standard tends to focus on the provision of ‘humanitarian’ UXO clearance (and hence tends to focus on NGO and UXO Lao modalities) and does not cover the issue of contractual UXO clearance, either by commercial or NGO operators. The Evaluation Team would recommend that, for example, National Standards should include a specific requirement for a contractual obligation for UXO search in areas likely to be contaminated and where the commercial user of the land is likely to expose its staff to risk from UXO. Such a requirement should also be fed into national planning legislation. There are also some quality management and quality assurance issues that arise in terms of the commercial context that should be reflected in the National Standards. These are discussed below.

Quality management, quality assurance and quality control

The first issue with national standards is in terms of quality management (QM). The Evaluation Team notes the wording of NS 9 (Draft Edition 1) on Quality Management and has the following observations.

Paragraph 6 of NS 9 says:

QM in UXO/mine action in Lao PDR is built upon two mutually supporting components.

These are:

a. Internal QM by UXO/mine action organizations.

b. External QM by the NRA.

The Evaluation Team believes this does not accurately reflect the role of a customer of UXO clearance in Lao PDR, who also has some sort of contractual role to carry out external QM. The recommendations below include a form of words for the quality management requirement for contractual purposes.

In terms of quality assurance, Paragraph 8 and Paragraph 8.1.1 of NS 9 say:

“External QM inspections will be carried out by staff from or controlled by the standards section of the NRA and involve both QA and QC being carried out concurrently”.

“External QA inspections will be carried out on clearance organizations to confirm that they are applying their approved operational procedures in a manner that will result in the safe, effective and efficient clearance/release of land and/or disposal of UXO”.

The Evaluation Team observes that the NRA is in no way capable of meeting this requirement at present, given that it has only a single staff member responsible for all elements of accreditation and quality management. The recommendations below set out some possible options for (a) quantifying the requirement and (b) providing the necessary QA cover.

Paragraph 8.2.1 says

“All clearance organizations carrying out UXO/mine clearance, including technical survey, will be subject to external QC inspections. These inspections will involve the physical inspection of samples of cleared or surveyed land to determine if clearance requirements are being achieved”.

The Evaluation Team are not convinced of the efficacy of carrying out QC sampling processes, given their cost and also given that the NRA office cannot even meet the simpler QA requirement described above. However, there is a case for leaving in this paragraph in order to maintain the ‘threat’ of a QC inspection for an organization that was manifestly non-compliant after QA monitoring. That being said, unless the NRA has at least some field QA/QC capacity the threat remains without substance.

Where external QC is to be carried out, the Evaluation Team believes that Paragraphs 8.3 and 8.4 are ambiguous. Whilst they do say that the QC team is to be appropriately qualified, they do not talk about how the QC inspection should be conducted and the QC team equipped (i.e. as if the land is still contaminated). Note that this does not necessarily apply to QA monitoring processes that have a less intrusive (and therefore less risky) procedure.

Post clearance impact assessment (PCIA)


There is considerable discussion in the UXO sector of post clearance impact assessment (PCIA). Whilst the Evaluation Team recognizes the importance of post clearance assessment of impact, there are reservations about how this should be done.

- PCIA should not become a self-fulfilling project in itself, lest it drive up cost of clearance to the point where it makes land less worthwhile to clear.
- PCIA, in its current format, is at the wrong end of the project cycle management process. More emphasis should be made at the prioritization and project planning stages to ensure the task will be beneficial. UXO area clearance is an irreversible activity: if we find that the task has not been worthwhile we are unlikely to put the UXO back, so the emphasis in terms of information gathering should be at the planning stage.
- Where clearance is in support of a development project, it is the development project that should be the focus of scrutiny for impact – as long as the UXO clearance is tightly constrained to the project priorities, there is no need for separate assessment of the UXO clearance, providing it is ‘fit for purpose’ (which is an issue of quality that should be addressed by quality management processes as described above). Development project managers should share their assessment reports with clearance operators.
- Where clearance is in support of ‘public works’ activities, it is again the prioritization mechanism that should be the focus of scrutiny rather than the individual clearance task, to ensure the criteria are correct. Again, this is really a task for project cycle management (in terms of planning) and quality management (in terms of ensuring compliance).




Figure 15. The Evaluation Team observing PCIA activity by Handicap International Belgium in Savannakhet (above), and the piece of land that had been cleared and was now in productive use (right). The turning point marker is visible in the foreground.





HI B Operations SOPs
UXO Integrated project



Annex L to SOPs 900 - Reports

POST CLEARANCE ASSESSMENT FORM

This report to be filled out by the UGBM, or the Operation Assistant, or the STL or the CTL. POIs assessments should be conducted within 6 months of the last mark made, after land has been released for use. Tick (x) or complete the boxes.

| | | | |
|---|-------------|--|-----|
| POI-01-02-03-04 / Village/ Locality Data | | | |
| App. Province | Savannakhet | District | |
| POI-01 | | POI-02-03-04 | 130 |
| Village's name | | Village code | |
| Y/N: POI-01-02-03-04 Village's GPS coordinates | | Latitude 16° <input type="text"/> N Longitude 106° <input type="text"/> E | |

| | | | |
|--|-----------------------------------|--|---|
| POI-05-06-07-08 / Clearance task data | | | |
| Rule 1 / NAME 1 | POI-05-06-07-08 | Clearance task date | |
| Date(s) of the site hand over | / / 2007 | App. POI-05-06-07-08 | C |
| App. POI-05-06-07-08 / Who owns the land and when the clearance occurred? | | | |
| POI-05-06-07-08 / Size of area been cleared and handed over. | | POI-05-06-07-08 / m2 | |
| POI-05-06-07-08 / AGE-09-10-11-12 / AGE | POI-05-06-07-08 / Adults | POI-05-06-07-08 / Children | |
| Total beneficiaries of the clearance | | | |
| POI-05-06-07-08 / POI-05-06-07-08 / What was the proposed land use for clearance occurring? | | | |
| POI-05-06-07-08 / Road access | POI-05-06-07-08 / Access to water | POI-05-06-07-08 / Crops | |
| POI-05-06-07-08 / Irrigation | POI-05-06-07-08 / Orchards | POI-05-06-07-08 / Building construction | |
| POI-05-06-07-08 / Hunting | POI-05-06-07-08 / Cemetery | POI-05-06-07-08 / Tourism | |
| POI-05-06-07-08 / Recreation | POI-05-06-07-08 / Other | | |
| App. POI-05-06-07-08 / POI-05-06-07-08 / Give detail in the space below if the land was cleared for other purpose. | | | |
| | | | |
| POI-05-06-07-08 / POI-05-06-07-08 ? | | POI-05-06-07-08 / Yes <input type="checkbox"/> | |
| Was there a development agency supporting the project? | | POI-05-06-07-08 / No <input type="checkbox"/> | |

Figure 16. The Handicap International Belgium forms for Level Two Survey (left) and for PCIA (below). The PCIA form asks for data that was not researched during the Level Two Survey Process, so no real judgement about likely impact could have been made at the planning stage of the project cycle.

Roving tasks

All of the UXO clearance operators have a roving team capacity for dealing with UXO spot tasks. In some cases the Evaluation Team heard that some UXOs were left intact (in one case for three years) because of apparent ambiguity in terms of which organization should take responsibility. There is an apparent need for a more effective mechanism for the allocation of responsibilities in this regard. In the medium term, the two main options appear to be:

- Dividing responsibility on a functional basis (i.e. one or more organizations specializing in roving tasks)
- Dividing responsibility on a geographical basis (i.e. an organization being assigned a specific responsibility for roving tasks within a mutually-agreed area of responsibility).

Efficiency

Cost capture. An area that remains contentious throughout the UXO Sector is the issue of 'cost'. Whilst on one hand it is good from the point of view of competition and hence efficiency that organisations become sensitive to their price, it is not so good if this is used as a justification for bias towards a particular organisation, especially if the mechanism for estimating cost is actually incomplete. The Evaluation Team finds that the commercial operators in Lao PDR are most likely to be able to capture their costs (given the contractual incentives for them to do so) whereas NGO operators and UXO Lao have a harder job to do in this regard, with UXO Lao facing the hardest task of all. In general, the cost capture process should capture (all) costs, including those not normally considered by accountants, namely the provision of 'in kind' contributions in terms of equipment donations and expatriate technical advisors (TA). Furthermore, funds for the future replacement of equipment should be included in current costing computations. There is also a significant problem comparing 'like with like' in terms of the cost of clearing for different types of projects.

One of the Evaluation Team members has done some research work on this issue²⁶, and a version of a budgetary analysis model has been provided to the TA for quality management in UXO Lao. The model is also freely available to other organizations, and a copy has been provided to UNDP and the STA at the NRA.

However, to a certain extent this problem will go away if the sector recognises the effective economic specialization between the two classes of project described above. If development projects have access to their own funds to purchase UXO clearance, and an appropriate tendering mechanism, then operators would be bidding on clearing the same project and this would help with the 'like with like' issue.

The issue of detailed cost capture for UXO Lao, and recommendations on how UXO Lao could eventually compete on funded development projects, is treated in more detail in Chapter 5.

Planning figures. The Evaluation Team found that at least three operators have had problems justifying their productivity targets, and one of the common problems is that they have no productivity calculator. An example of such a calculator has been generated by the

²⁶ See <http://maic.jmu.edu/JOURNAL/7.3/notes/keeley/keeley.htm>.

Evaluation Team and is included in Chapter 5. However, given the prevalence of this problem it might be worthwhile for the NRA office, as part of the standards and accreditation procedures, to develop an independent benchmarking test facility, perhaps at the UXO Lao training centre.

Area Clearance: Conclusions

The objective in the National Strategic Plan for Area Clearance is:

Survey and Clearance: “All agricultural areas considered to be ‘high priority’ will be cleared, as well as a sizeable portion of other areas identified as ‘medium priority’ – for a total of no less than 18,000 hectares (180 square km) of land cleared by UXO Lao alone”;

The Evaluation Team found that:

- UXO Lao’s target between 2003-2006 was 5542 Ha. Actual clearance during the period was 5798 Ha. At current rates of clearance, the target will be achieved by the end of 2013.
- No records have been kept in regard to the distribution of high and medium priority.

The Evaluation Team believes that a strong case can be made for UXO area clearance in terms of supporting development projects, and that such activity should be encouraged and enhanced.

The Evaluation Team believes that a case can be made for UXO area clearance in terms of support for poverty reduction through the clearance of individual agricultural land plots. However, as discussed in Chapter 2, there is a comparatively weak connection between UXO contamination and the utilization of agricultural land by individual households. There is also a limit to how much of such additional land could actually be utilized by a beneficiary. The prioritization processes for such types of area clearance are also quite weak at present. Therefore, any resource allocation process should place a higher emphasis on support to development activity rather than poverty reduction.

The Evaluation Team finds that there is a stronger case to be made in the reduction of accidents through the provision of a roving response. The Evaluation Team notes that the current formulation of “The Safe Path Forward” under-emphasizes the role for roving teams in this regard. There is a need to (a) deal with a backlog of ‘spot tasks’ and (b) to establish the quantitative requirement for establishing how many roving teams are needed in the medium term. Suggestions for how this might be done are included in Annex 2. Finally, there is a need, at a sector level, to formalize the differing responsibilities for roving tasks between UXO Lao and the NGO operators.

The Evaluation Team commends the work done by the NRA to develop national standards. Additional work is needed in two areas: 1) making the national standards more applicable to commercial UXO clearance activities, and 2) developing a credible quality assurance capacity within the NRA.

Post clearance impact assessment (PCIA) processes have a value in ensuring that UXO area clearance work is relevant, though the Evaluation Team is concerned that the development of too extensive a PCIA structure could be counter-productive in terms of transaction costs. The Evaluation Team believes more work should be done within the project cycle management in

terms of appropriate task planning (pre-clearance) and prioritization processes, and a modest level of QA monitoring activity.

The Evaluation Team notes that the sector needs to have a common framework for cost capture and performance measurement so that cost comparisons among operators can have credibility.



Figure 17. A BACTEC clearance site in the Xepon goldmine

5. NRA Performance: Findings and Conclusions

Evaluation Objective #2: Evaluate whether the structure of the UXO Sector is correct²⁷ and if the NRA is providing effective leadership, governance and coordination as stipulated in Part IV, Institutional Arrangements of the National Strategic Plan.

NRA Status and Functions

UXO Lao carried out the regulatory functions in the sector until the National Regulatory Authority (NRA) was created in 2004. At that time, UXO Lao and the NRA became two separate entities. NRA became the regulatory authority for UXO activities and UXO Lao became solely a UXO operator.

The establishment decree for the NRA created it as an inter-ministerial body comprised of representatives of 9 ministries concerned with UXO activities under the leadership of a Deputy Prime Minister. The Deputy Prime Minister is also Minister of Defense²⁸.

The NRA was given the following responsibilities:

1. The periodic review and implementation of the Strategic Plan.
2. The definition and provision of policy direction.
3. The accreditation, licensing and oversight of all UXO/Mine Action operators.
4. The management of the database and, as such, the prioritization and related tasking of all UXO/Mine Action operators.
5. The coordination of all UXO/Mine Action activities throughout the country.
6. The external Quality Assurance of all UXO/Mine Action activities.
7. The conduct of Post Clearance Impact Assessment.²⁹

With support from a UNDP-funded project approved in early 2006, the NRA, often referred to as the NRA Board, established the NRA office. Thus, the NRA office has been in operation for only a little over two years and is still a work in progress.

The NRA office has the following roles and responsibilities³⁰:

1. Act as the secretary of the NRA on all matter related to UXO/MA in Lao PDR as assigned.
2. Recommends to the NRA Board the relevant UXO/MA related policies, strategies, budgets and operational plans for comment, amendment and official adoption/promulgation;

²⁷ Recommendations for the structure of the sector are presented in Chapter 7 along with recommendations for revision of the National Strategic Plan.

²⁸ Decree on the Establishment of the National Regulatory Authority (NRA) for the UXO Programme in Lao PDR, Ref. 33/pm, 17/3/2004

²⁹ Decree on the establishment of the National Regulatory Authority (NRA) for the UXO Programme in Lao PDR, 17 March 2004 and The National Strategic Plan (The Safe Path Forward), Part IV, Institutional Arrangements.

³⁰ Prime Minister's Office, "Decision On the organization and activities of National Regulatory Authority For UXO/Mine Action Sector In Lao PDR", 30 March 2006

3. Define, adapt and/or modify the structure, the sections and the departments of the NRA according to the needs and requirements of the organization, in consultation with the Board;
4. Responsible for the management, administration, accounting and the use of all property of the NRA.
5. Collect, analyze and disseminate information related to UXO/MA sector in Lao PDR.
6. Represent the NRA Board to coordinate with organizations, local authorities and all stakeholders related to design the management or monitoring plan for UXO/MA activities in Lao PDR that include regulations, technical issues, the awareness raising of impact of UXO on the socio-economic development and procedures to solve that problem.
7. Follow up, monitor, encourage and support the implementation of the National strategic plan for UXO/MA sector in Lao PDR and other related laws and regulations.
8. Monitor the activities of UXO/MA operators in Lao PDR and local offices as well as other related sectors in order to periodically report to the NRA.
9. Represent the NRA Board for the financial operations of the NRA and its Office, according to the budget approved by the Board and is financially accountable for those operations, in accordance with the laws of the Lao PDR.

The NRA Board appointed the Director of the NRA office following consultations between Government, UNDP and other donor representatives. The two deputies were hired through a competitive process that included the NRA director and UNDP representatives on the interview panel. The job description of the Director tasks him with responsibility for implementing the functions of the NRA set out in its establishment decree.

At this writing, the basic organizational structure of the NRA office is in place to address the core functions of the NRA, Lao personnel have been hired for management and technical positions, and a core of six international technical advisors are on board – provided by various donor organizations - to provide technical guidance and build capacity. Under the Director, the NRA office has a deputy for administration and policy and another for operations. In addition, there are 19 local technical and administrative personnel working at the office. In general, the office has been established in an expeditious manner and its operations moving forward smoothly, if slowly.

The status of the NRA office is a bit ambiguous. The word “authority” in its name suggests a Government institution. In reality, the NRA office is the project implementation unit for a UNDP-funded project, “Establishment and Support of the UXO NRA” and, as such, a temporary structure. All Lao personnel working at the NRA office are paid by from UNDP project funds. As a project, the NRA office is dependent on the donor funding arrangements that are likely to prove to be unpredictable.

NRA Performance: Leadership and Policy Direction

NRA office is leading a number of substantive initiatives in the sector. These include:

- Promotion within the Government of Lao PDR of accession to the cluster munitions treaty. Accession to this new convention may bring with it substantial new resources that could be used for additional UXO activities.

- Promotion of implementation and review of the current strategic plan, “The Safe Path Forward”, which was approved before the creation of the NRA. This evaluation, which has been organized under the auspices of UNDP and NRA, should provide input into the strategy review and new strategy formulation.
- Providing basic data and reports to stakeholders in Government and the international community on UXO activities and achievements against the national strategic plan.

In other areas, more needs to be done. The NRA and the NRA office have not been able to fully communicate the new role and functions of the NRA to all concerned parties. As yet, many in Government do not fully understand that UXO Lao and the NRA have become separate entities and the nature of the NRA’s regulatory functions.

On another issue, NRA leadership on the mobilization of Government resources to support UXO institutions and programs has not been bold enough to satisfy some donors who regard Government financial contributions to NRA and UXO Lao as too low and as a sign of lack of Government commitment to the sector.

Sectoral Coordination

The NRA office has carried out some useful coordination work in the sector.

- The NRA office with strong donor support has organized sub-sector working groups of all interested stakeholders on UXO clearance, risk education, and victim assistance. Participants in these groups have developed and reached consensus on sub-sector work plans to guide work planning by individual operators in the areas of risk education and UXO clearance.
- A sector-level working group has been organized and held its first meeting in mid-July.

Coordination has its limits, however. The NRA functions of priority setting and tasking of all UXO operators in the country and the coordination of all UXO/Mine Action activities throughout the country were written at the time when the UXO Lao was the main UXO operator in the country. Now that there are several clearance operators in Laos that include both international non-government organizations and commercial firms, the coordination task assigned to the NRA appears to be overstated. For example, the NRA cannot “task” a commercial operator doing UXO clearance under contract to another commercial firm, such as, in the case of Bactec’s UXO clearance contract with the Lane Xang Minerals gold and copper mine. In addition, NGO operators negotiate agreements directly with provincial and district officials on the areas in which they will operate. The NRA cannot directly “task” these operators other than by directing them to prioritized provinces or districts.

In a related area, the NRA office has attempted to control resource mobilization activities, a function not specified in the NRA’s responsibilities. In one case, this led to confusion and a lost opportunity to mobilize additional external resources for UXO activities. The NRA office now affirms that operators are all free to mobilize their own resources.

Governance

In regard to governance of the UXO sector, NRA has been assigned three functions related to UXO clearance: 1) accreditation of UXO clearance operators, 2) quality assurance of field operations, and 3) post clearance impact assessment (PCIA).

Accreditation

With the assistance of technical advisors and guidance from international UXO/mine action institutions, the NRA office has adapted draft standards for UXO clearance operations for Lao PDR. Operators have provided initial comments on the draft standards. The NRA office is now in the process of sending the finalized version of the standards back to the operators for final review, after which they will be submitted to the NRA for formal approval.

Approval of the national standards is expected later this year. In the meantime, the NRA office has been using the draft standards as criteria for accreditation of clearance operators.

To date, the NRA has accredited three clearance operators, three are pending accreditation and two have yet to apply for accreditation (one of which is UXO Lao). The accreditation process so far has been quite lengthy, up to a year in some cases. In future, the NRA office aims to reduce the length of the accreditation process to six months maximum.

The NRA office has yet to establish regulatory control over UXO activities carried out on projects managed by Government agencies with funding from international development banks and nor has been extended its purview to include UXO activities of the Lao military. In addition, it is unclear whether all mining, plantation and other concessionaires and investors are committed to clearing contaminated land in their project areas.

Quality Assurance

The quality assurance function is supposed to ensure that accredited operators are carrying out UXO clearance in accordance with Lao PDR standards. As the national standards have not yet been approved, the function is in limbo. At present, one international technical advisor and one Lao national staff are working on standards and quality assurance. The NRA office is in the process of hiring another Lao national for this function.

Post Clearance Impact Assessment (PCIA)

Post Clearance Impact Assessment is supposed to determine the land use (or non-use) of land that has been cleared. While some operators are making efforts to carry out PCIA, the NRA office has yet to focus much attention on this subject. The annual report on Handicap International Belgium's (HIB) work in Savannakhet provides some useful feedback on their PCIA assessments:

“While it is difficult to measure the impact overall from the PCAs it was found that land released to the beneficiaries under the action was being used for the purpose it was intended for. Land was being used for agricultural purposes leading to changes in the wellbeing of communities due to the increase in land available for use, an increase in productivity of land, the removal of obstructions to normal daily activities, a greater feeling of safety amongst individual and an improvement in food security. PCAs also provided a form of QC on the UXO area clearance or technical survey carried out since land was being used safely and there were no accidents on the land which had been released under the action³¹.

The HIB experience provides useful lessons for the NRA office. “Impact is difficult to measure”, “land...was being used for the purpose it was intended for,” and “there were no accidents on the land which had been released”. In other words, gathering this level of data is a relatively simple task and that deeper analysis would be costly and time-consuming.

³¹ Handicap International Belgium, “Integrated Unexploded Ordnance Threat Reduction in Savannakhet Province”, Final Report, 23 November 2007, p. 7

Conclusions

Relevance

- In general, the functions of the NRA are relevant and important for the UXO sector. The tasking function has been found to have limited relevance and the post clearance impact assessment function has been conceptualized in terms that are overly complicated.

Efficiency

- The establishment of national standards and the process for accreditation of clearance operators are areas where greater efficiency would benefit the sector. The lack of approved standards has exacerbated the delay in implementation of the quality assurance function by the NRA office.

Sustainability

- The NRA office in its present form is not sustainable. The office is a project whose existence is wholly dependent on donor funding. The question should be asked: what regulatory capacity should the Lao PDR have for the medium and long term? Where should such capacity reside? The evaluation team suggests that the current capacity being developed for the NRA office may only be necessary as long as there is intensive UXO clearance work going on. The scoping exercise suggests that the period of intensive clearance might last another 16 years.

6. UXO Lao Performance: Findings and Conclusions

Findings

In general, the findings of the evaluation of UXO Lao in the context of its performance since the reorganization of the UXO sector in Lao PDR are reasonably positive. UXO Lao has gone through some significant changes in size and scope, and is now positioned as an ‘operator’ in the sector providing services in area clearance, roving clearance and community awareness. It is successfully meeting its clearance targets. Higher policy functions have been moved to the Office of the National Regulatory Authority (see Chapter 4) and the relationship between UXO Lao and the international organizations has been clarified, with most of these agencies now operating independently in a open and competitive environment with UXO Lao and each other. Fiduciary oversight is provided by UNDP and there is an informal external management oversight function provided by the expatriate technical advisors that remain within UXO Lao. However, some detailed observations about the current structure and performance of UXO Lao are, in the opinion of the Evaluation Team, still worth further attention. It is hoped that these findings, and their attendant conclusions and recommendations, will be seen in the context of the Japanese concept of ‘*Kai-zen*’ (‘continuous improvement’), i.e. as suggestions as to how the positive development of UXO Lao may be encouraged and further improved.

Resource allocation

UXO resources are allocated as per the requirement in the Strategic Plan (“The Safe Path Forwards”) and so in a narrow sense are complying with their targets. However, the resource allocation in the Strategic Plan clearly states that this resource allocation plan is merely a re-statement of the actual resource allocation of UXO Lao clearance teams in 2001. The key points in the context of UXO Lao are that UXO Lao continues to be in only nine of the contaminated provinces, and there has been no attempt to review the process by which their teams are allocated. This is true not only for area clearance, but also for roving and community awareness (CA) teams.

Prioritization

The key issue in the context of the UXO sector is that of prioritization. One can ‘do the job right’ in terms of efficiency and even ‘do the right job’ in terms of effectiveness in meeting program targets, but if the targets are not appropriate the impact of the project is unlikely to be optimum.

The Evaluation Team finds that the prioritization process used by UXO Lao is complicated, unwieldy and, as a result, rather unresponsive. UXO Lao staff members gather most of the data for prioritization decisions. Whilst other officials are consulted at a District level, this sometimes merely consists of putting a completed work plan in front of an official for his approval. Thus, all of the tasks that have already been filtered out of the process may no longer be visible. Even where the officials take a greater role in the process, at District and Provincial levels there is no set of criteria or the national principles to guide them in the determination of priorities. (The evaluation team posed this question three times at both District and Provincial levels and the answer was consistent, so even if actually such criteria do exist they are not being communicated). The absence of consistent criteria for prioritization means that the potential beneficiaries are subject to a “postcode lottery” in that

the type of service they receive may vary purely as a result of where they live rather than what circumstances they face.

Even where District officials are involved in the planning process they have too many other responsibilities to follow up on what the UXO Lao teams have done and so there is no independent feedback loop in the process, contrary to best practice in terms of project cycle management. The Evaluation Team is also not sure to what extent the further deliberations at a province and national level add to the work plan process in its current form, given how far these officials are from the Districts in which the teams are working and the absence of any formal criteria against which they can evaluate the District work plans³².

The Evaluation Team was shown a score sheet (see Annex 3) against which a proposed task could be scored and therefore ranked, but the formulae in the calculating cells are locked and invisible, and there is no set of explanatory notes (in either Lao or English) that explains how the scoring system works, let alone allow the authorities to participate in designing the scoring process so that it makes a 'best fit' with Provincial development or poverty reduction strategies.

Whilst there is no evidence of any rent-seeking behaviour amongst UXO Lao personnel involved in the process (and indeed everyone that the Evaluation Team met seemed personally committed to their job), the structure of the prioritisation process is such that it is possible that such acts or other forms of preferential treatment towards potential beneficiaries could take place.

Another facet of the UXO prioritization process that causes problems in terms of their overall impact is the inflexibility of provincial work plans. This was a source of complaint amongst development agencies to the Evaluation Team. The problem seems to be that the current processes of UXO Lao require the detail of the prioritization process to be passed back up the chain to Vientiane. The Evaluation Team is unsure of the added value in this regard.

Community Awareness

UXO Lao developed an approach to community awareness and been implementing it with some modifications and updates for over ten years. The approach sends a community awareness team to one village per week for four days of awareness activities. The program consists of:

- Day one: travel and meeting with village head to plan activities.
- Day two: activities for children, including games and puppet shows.
- Day three: activities for adults, divided into males and females.
- Day four: activities to illicit feedback from villagers to check their understanding.
- Day five: return to office and report preparation.

At present there are 10 community awareness teams of 5-6 people around the country. Two are located in Xieng Khouang province and one each in the other eight provinces of UXO Lao activity. The teams have trained 349 village volunteers to supplement their outreach. These

³² There is another level of complexity here: UXO Lao are organized into a number of clearance teams, but the teams may be working across more than one District, so a Team Leader has to spread his time between them accordingly. This means that, in the development of their annual works plan they have to define to what extent this is a 'District' or a 'Team' plan.

volunteers carry out community awareness work in their own villages and neighboring villages using the same materials as the teams.

UXO Lao statistics report that community awareness teams have visited 6,659 villages since 1996. However, this number counts visits, not separate villages so one village may have been visited more than once. No record was kept as to whether the 2,861 villages³³ identified as contaminated with UXO in the 1997 survey, “Living with UXO”, which was used to set the target in the National Strategic Plan for community awareness, were visited or not.

The community awareness teams collect information about any UXO found in the village, but are not allowed to deal with these items directly. The teams report this information to their respective provincial offices.

The UXO Lao community awareness programme has never been externally evaluated. The following case study suggests that claims that community awareness work is contributing to accident reduction are over-stated.

Community Awareness and Accident Reduction: A Case Study

Data from Champasak Province are used as a case study. The Evaluation Team assumes that Champasak is representative of all nine provinces. The detailed analysis is done via an Excel spreadsheet created by the Evaluation Team. A copy of the spreadsheet is available on request. Use of the spreadsheet allows the data to be changed if it is felt that Champasak is somehow not representative, or if the other assumptions made in the analysis are incorrect.

Firstly, it is possible to plot the casualties in Champasak on a graph (see Figure 18 below). The casualty data provided by the UXO Lao provincial office is used. The records show a total of 109 casualties in the province: the trend of the figures is downward (which is obviously good news) with the last two years appearing to be asymptotic. The Evaluation Team notes that the victim survey being conducted by the NRA suggests that there is a considerable ‘dark figure’ of victims that have not been found by UXO Lao in the past, but the Evaluation Team assumes that whilst the total numbers may indeed change the trends are likely to be similar. However the same analysis can be re-done when the new NRA figures are available.

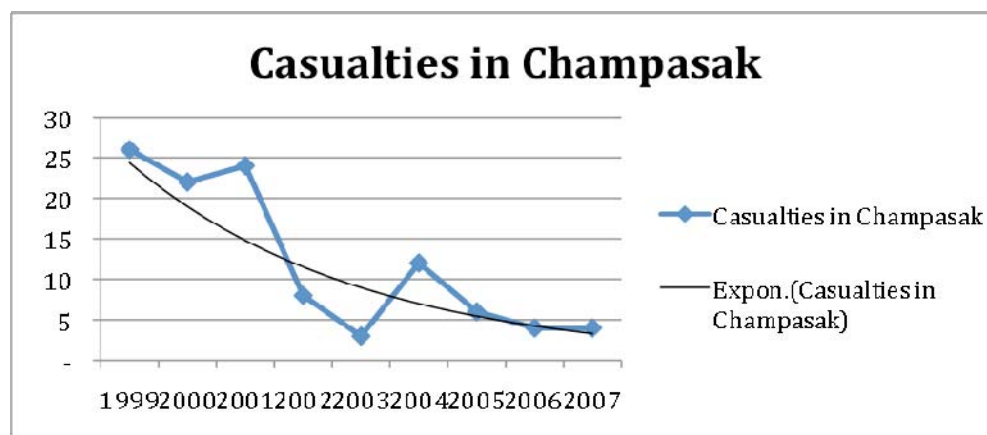


Figure 18. UXO Casualties in Champasak Province.³⁴

³³ Actually only 2,636 of these villages are in the nine provinces where UXO Lao works.

³⁴ Source: UXO Lao, Champasak Provincial Office.

Secondly, in analysing the causes of the fall in casualties it is possible to assume that 100% of the reduction over time is due to the CA intervention. This is a generous assumption but if it is true it would mean that, without CA, the number of casualties in Champasak would have been 234, meaning that, with this assumption in place, that the CA has averted 125 casualties.

Thirdly, the Champasak data informs us that the CA teams were able to reach nearly 164,000 people over the time they have been operating, with an average of around 18,200 per year (though the Evaluation Team notes a significant drop in 2007). Again, taking a generous position it is possible to assume at this stage that these are different people and the CA team is not just repeating trips to the same communities³⁵.

Fourthly, it is possible to consider the cost of the CA service. Data from UXO Lao suggests the average cost of a CA team is around \$28,000 per annum. This does not include all costs and the Evaluation Team is aware that there used to be more than one CA team in the province. An average estimate of \$40,000 per year is therefore used, though the spreadsheet has the capacity to model changes in this figure.

It is therefore possible to calculate the cost of intervention both in terms of cost per recipient (around \$2.20) and cost per accident averted (around \$9,600). With a VSL (“value per statistical life”) of \$10,000³⁶ this means that the CA process appears to be cost effective, in that its net benefit to the socio-economic structure is positive. However, as previously noted, this calculation is based on the most generous of assumptions. Adjusting the effect of the CA message by reducing the original impact from 100% (i.e. everyone who hears the CA message immediately modifies their behaviour) shows that, all other things being equal, the CA process has to achieve a behaviour modification rate of 30% in order to break even. Such levels of efficacy are regarded as being unlikely³⁷.

Finally the Evaluation Team suggests that the casualty data trend can be interpreted to show that all of the people who are able to easily modify their behaviour have done so, and the asymptotic characteristic of the graph suggests that we are now in a situation where provision of ‘knowledge’ about UXO is unlikely to make much of a difference; i.e. the community awareness activities are in a situation of diminishing marginal returns.

Roving teams

UXO Lao deals with isolated UXO reported as ‘spot tasks’ using what is known as a ‘roving’ team. The team consists of around 10 people including a driver and a medic managed by an EOD Level 3³⁸ technician. The roving team is able to deal, on a technical basis, with all types of UXO found in Lao PDR. UXO Lao has a long history of developing technical capacity in this regard and the Evaluation Team heard nothing but praise for the competence of UXO Lao’s EOD technicians. Indeed, UXO Lao manages the national training centre for the entire UXO sector and other operators (such as MAG) routinely put their staff through UXO Lao training courses. The Evaluation Team regards the operation of the roving teams as

³⁵ If the CA teams are repeating trips to the same people it would mean that more money is being spent per beneficiary to provide the CA message.

³⁶ The VSL is calculated by assuming an average of \$1 per day income for the beneficiaries, multiplied over an average working life of 30 years and then rounded off.

³⁷ See, “A Study on the Dramatic Decrease of Mine/UXO Casualties in 2006 in Cambodia,” Ruth Bottomley, February 2007, which also suggests a weak relationship between mine risk education and casualty reduction.

³⁸ Level 3 is the level of EOD skill needed to manage the disposal of large bombs, derived from National Standards.

the primary output of UXO Lao in respect of their contribution to accident prevention through the removal of reported UXO. This being said, there are several observations, set out below, about the way that the roving teams are managed that detract from their potential impact.

- The roving teams are area clearance teams that work part time on roving tasks. Whilst this has positive benefits in terms of flexibility and cross-training of team members, UXO Lao's only existing target is the clearance of a specified quota of hectares; it is therefore very tempting for Provincial Coordinators to use teams more in the area clearance role to help ensure they meet this target.
- There is a prevalent sense of risk-averseness amongst UXO Lao managers about dealing with large aircraft bombs, due to the potential risk to neighbouring infrastructure in the event of an unplanned detonation. This seems to be contributing to a reluctance to deal with aircraft bombs in a timely manner, even where the UXO Lao EOD technicians have the technical capacity to do so. It appears a legacy of past times when UXO Lao provincial offices could rely on the presence of expatriate technical advisors at a large bomb to take political responsibility for its clearance. One province (Saravane) reported that it has a backlog of some 130 large aircraft bombs; the statistics of one other province show a large drop in numbers of aircraft bombs being dealt with (from an average of 60 per year to around 2 per year) once the expatriate technical advisors were withdrawn. This sudden drop does not appear to be consistent with a diminution of the number of bombs being reported, which one would expect to be more gradual. It is clear that this risk-averseness is having a negative effect on impact: the Evaluation Team heard several stories about aircraft bombs being neglected for several years. In Savannakhet Province, a bomb reportedly remained *in situ* for some three years after the UXO Lao office was notified. A scrap metal dealer eventually removed it.
- The roving teams have large numbers of personnel, in order to manhandle large bombs and also to deploy as sentries. These latter tasks are inappropriate and inefficient uses of clearance personnel. For smaller UXO, it should be possible to make do with less people in each team, which could allow more people to remain with the clearance task or for more, smaller teams to be formed. Teams could then be combined when they are needed to deal with a big bomb (which, based on a figure of 60 bombs per year, would only be around once a week).

Figure 19. Roving team from Champasak





Figure 20. The Evaluation Team observing the demolition of a 250 pound bomb by UXO Lao in Champasack. It is clear that UXO Lao's EOD technicians have reached a high level of technical skill.



Effectiveness

In terms of the targets set out for UXO Lao to meet over the period covered by this report, UXO Lao can be said to have been very effective. Although they performed slightly under target in the earliest years, they were later to exceed annual targets and have therefore exceeded the target for the period covered by the strategic plan by 5%. There are however questions as to whether these targets were as relevant as they could have been and whether they have been met at the expense of quality and/or impact, both of which are discussed below. One might nevertheless make the case that it is not really UXO Lao's fault if the targets which they were given are retrospectively found to be inadequate, which is why there is little value in making the focus of this report too retrospective and instead concentrate on making a good thing better.

There are however three areas in which UXO Lao might make its activities more effective³⁹. The three areas are:

- Standards, accreditation and targets
- Enhanced Technical Survey and other risk management techniques
- Quality Assurance and Quality Control.

Standards, accreditation and targets

In the absence of standards, quality of *any* production process will tend to move to the lowest common denominator of acceptability. There has been a lot of work in the UXO Sector in Lao PDR to produce a good set of national standards against which the quality of UXO clearance and other activities can be measured to demonstrate fitness for purpose. However, if these standards are not applied across the board there is room for a defaulting agency to reduce costs through the reduction of quality. Whilst the Evaluation Team notes the fact that the National Standards are still in 'draft' form (and agree that this delay is unfortunate) they are not persuaded by the argument that this justifies UXO Lao not having presented itself for accreditation. It is understood from UXO Lao that they intend to present their documents for accreditation in the very near future. Submission to the accreditation process and cooperation with external quality assurance monitoring will actually work to further improve the credibility and reputation of UXO Lao.

One particular issue where quality could become an issue is in terms of production quotas for area clearance teams. The "Safe Path Forward" provides a clear requirement specifically for UXO Lao to increase its productivity in terms of hectares of ground searched and declared clear every year. In a situation where an organization is inefficient in some respect it is indeed possible to imagine that such an increase in output is possible merely through improving efficiency, discipline, attendance or other work practices. However it is also possible to see how the law of diminishing returns could soon take effect. Indeed, it is clear that there must come a point where, if no new resources are provided or new techniques adopted or new technology made available, then the only ways in which the junior managers can reach targets is to either exaggerate their reports or reduce standards in the actual clearance work. The Evaluation Team did not – with one possible exception – witness any possible occurrence of such practices but would wish to counsel against the continued increase of clearance targets every year without taking these complicating factors into account.

³⁹ These are in addition to the issue of roving clearance teams, which were discussed in the section on 'Impact' below.

| Table 6: UXO Area Clearance Planning Time Calculator | | | | |
|---|--------------------------------------|---------|-------|---------------------------------|
| Ser | Planning datum | Value | Unit | Remarks |
| (a) | (b) | (c) | (d) | (e) |
| 1 | Time to clear 1 m2 | 1 | min | |
| 2 | Available time per day | 6 | hours | |
| 3 | Working days per month | 21 | | |
| 4 | No of deminers per team | 12 | | I.e. number operating detectors |
| 5 | No of working months | 11 | | allowing for public holidays |
| | | | | |
| 6 | Available time per day | 360 | min | |
| 7 | Maximum area covered per deminer day | 360 | m2 | |
| 8 | Max area per deminer month | 7,560 | m2 | |
| 9 | Max area per team month | 90,720 | m2 | |
| 10 | Area per team year | 997,920 | m2 | |
| 11 | Area per team year | 99.79 | Ha | |

The planning time calculator at Table 6 above was created by the Evaluation Team to validate the clearance figures given by one of the UXO clearance team leaders. It shows that it is theoretically possible to achieve the clearance team's target of 98 ha/year, if an average clearance rate of 1m2/min per deminer is achieved. However, the model (which is available in Excel format) shows how sensitive the target is to any changes in the assumptions (marked in yellow). For example, a 10% reduction in the average time taken to search a 1m2 box (i.e. from 1 minute to 1.1 minutes) translates directly to a 10% reduction in performance (from 99 Ha/year to 90 Ha/year).

Similar sensitivity exists in the number of team members available for work. Changing the number of team members from 12 to 11.75 (i.e. having one team member sick for one week) reduces the output from 99 Ha/year to 89 Ha/year. The team therefore feels that the target is unrealistic, and should be modified to reflect what is feasible rather than what is theoretically obtainable.

Discussions with respondents suggest that a daily planning target of 250m2 per deminer day is more reasonable and would minimize the risk that junior managers have to find creative ways of making up apparent shortfalls in their performance statistics.



Figure 21. Variations on a theme: in two of these photographs lane marking was clearly visible (marked with yellow arrows). In the site shown in the picture on the left there was no lane marking, just a single lane marked by red and white posts (marked by the red arrow) whose purpose was unclear.



Enhanced Technical Survey (ETS) and other risk management techniques

UXO Lao has recently included a new process with the intention of ensuring that UXO area clearance resources are concentrated on clearing land that is actually contaminated. This process is known as the ‘Enhanced Technical Survey’ or ETS process. The term “Technical Survey” is defined by International Mine Action Standards (IMAS)⁴⁰ as the detailed topographical and technical investigation of known or suspected mined areas identified during the planning phase”. As this is exactly what the ETS process purports to do it is unclear to the Evaluation Team (and indeed, to all stakeholders interviewed on this subject) what is ‘enhanced’ about it. There are however some more substantive observations on the validity of the ETS process and these are discussed in more detail below.

The ETS is a two stage process: the first stage is a preliminary desk assessment during which documentary evidence is considered for a possible clearance task, with the intent of determining whether there is a risk of contamination being present. The three possible outcomes of this process are understood to be:

- High likelihood of UXO contamination being present: conduct full clearance
- Medium likelihood of UXO contamination being present: conduct sampling process
- Low likelihood of UXO contamination being present: release land for immediate use.

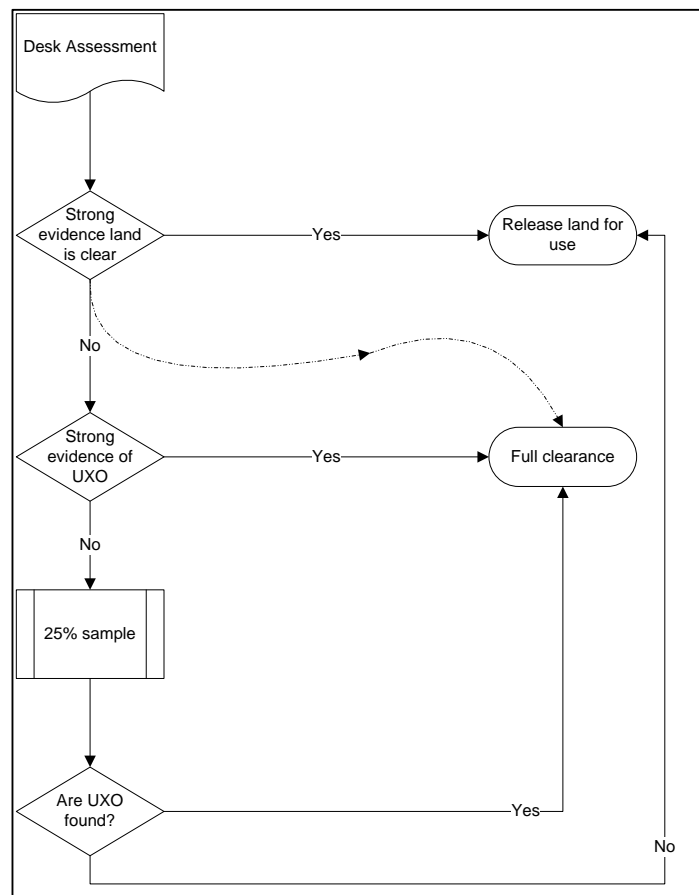


Figure 22. The Evaluation Team's understanding of the ETS process. Note how sampling becomes selected if there is no strong evidence either way for the presence of UXO.

⁴⁰ See IMAS 04.10 Para 3.249.

Only in the event of the second outcome being suggested should the second stage of the ETS process take effect; this is a 25% random sample⁴¹ of the candidate task site. The idea being that, if no UXO are found in the sample, then the land is released for immediate use⁴². These two stages must therefore be considered separately. It may be easier to work backwards, and thus look at the sampling stage first.

IMAS 09.20 is entitled “Guidelines for Post Clearance Sampling” and it provides advice on how a monitoring body can establish a sample size for the purposes of confirming whether a clearance process has achieved the desired quality requirement, which in simple terms is where no landmines or UXO remain in the work area to a previously specified depth. However this sampling process is based on the intellectual and statistical principles that underlie ISO 9000, and these are only valid where there is a sustained and consistent process involved that can be subjected to statistical rules. In other words, we are sampling the clearance *process*, not directly sampling for whether landmines or UXO remain. In the opinion of the Evaluation Team it is inappropriate to use a version of this post clearance sampling technique for the sampling of an uncleared area to determine whether or not it has UXO present⁴³. In such a situation, it is therefore also impossible to state with any degree of confidence whether or not a 25% sample size is appropriate⁴⁴. None of the Evaluation Team members are professional statisticians, but it appears that the confidence level of the sampled lots is 100%, and that of the unsampled lots is 0%. Given that there is little or no serial correlation between each square meter of the sampled area and the next (i.e. the absence of a UXO in one point does not tell you whether or not there is one in the next box⁴⁵), this suggests that there is an overall confidence level of 25% for the site as a whole.

Also given that the search technique used for sampling within the ETS is the same as used for full clearance, the ETS sampling process is not, in essence, inherently any more efficient than full clearance: for every hectare that the same resources could clear to 100% confidence they are merely now clearing some four hectares with a confidence level of 25% at the same sort of resource expenditure⁴⁶. This could have downstream liability implications for UXO Lao if there is a subsequent UXO accident on an area searched for UXO using the ETS process.

⁴¹ In Paragraph 3.224 of IMAS 04.10, random sampling is defined thus: “...in the context of humanitarian demining, the term refers to a defined procedure whereby part or parts of an area of cleared land are taken, for testing, as a representation of the whole area”.

⁴² The corollary is, in the case of cluster munitions, if one ‘bombie’ is found during the ETS the site is confirmed as being contaminated and the site is subsequently subjected to full clearance.

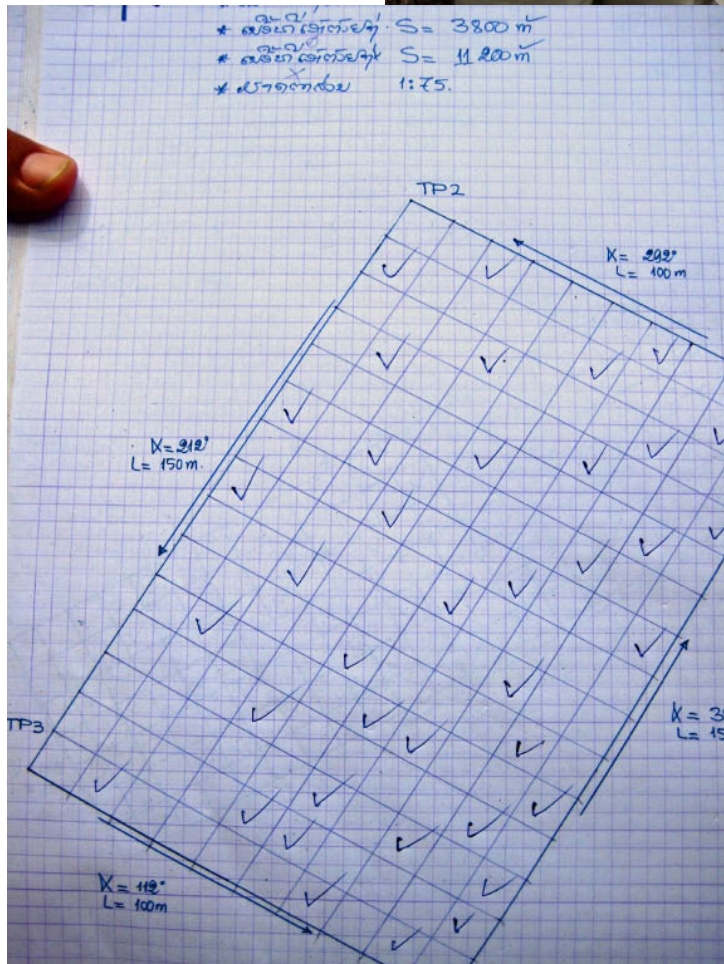
⁴³ Simply put, mathematicians recognize a difference between risky conditions (where the chances of all possible outcomes are predictable) and uncertain conditions (where one or more parameters are unknown). It may be that the disposition of UXO are too uncertain for this model to be accurate. The comparison of risk and uncertainty was first made by Frank Knight in his book “Risk, Uncertainty, and Profit” (1921) which led to the award of the Nobel Prize for Economics. See <http://www.econlib.org/LIBRARY/Knight/knRUP.html>

⁴⁴ Appropriate in the sense of being efficient or effective (if it is too large it will be effective but not efficient, if it is too small it will not be effective even if it appears efficient)

⁴⁵ This point does not seem to be well understood in the ETS procedures. The ETS SOP (as explained by several respondents) requires the ETS team, if they find an item of UXO that is not a bombie, to first search each square metre box immediately around the find. The team is at a loss to find a statistically valid explanation for this intermediate stage in the way it was explained.

⁴⁶ To be fair, none of the respondents have tried to justify the statistics behind the ETS; the point made that it is a confidence building measure for the end-users of the land where a statement of the results of the desk assessment is expected to be ineffective in allaying fears of potential UXO contamination. The question is whether or not this is morally justifiable, as it is used to persuade the beneficiaries that the area is cleared when in fact it is merely sampled to 25%.

Figure 23. Briefing on the UXO Lao Enhanced Technical Survey (ETS) process.



However, the sampling stage of the ETS process cannot be examined in isolation from the first stage of the ETS process. The sampling stage follows the desk assessment and it is intended as a process to confirm a hypothesis that there will be no UXO present. Whilst this is intuitively reasonable it is probably fallacious for two reasons: firstly it is generally accepted in science that it is impossible to prove a negative, and secondly there is a problem of adverse selection. A sampling process is likely to be, from a logical perspective, most effective in areas where there is a high prior confidence that UXO are present, the logic being that the more UXO there are the more likely it is that one will be encountered by the sampling process. This is precisely the type of place where it is needed the least, because the balance of probabilities from the desk research has already suggested that there are UXO present. Conversely, in the area where a sampling process is needed *most* (i.e. where the desk assessment suggests that there is little probability of UXO contamination being present) the sampling is *least* likely to work as there is only a 1 in 4 chance of finding a UXO using this process.

One can therefore see that the desk assessment element is potentially far more significant than the field sampling process within ETS, providing that the users are willing and able to release at least some of the land at this stage based on documentary evidence alone. Unfortunately, however, there are strong indications that the desk assessment element of the ETS process is the section that is least understood within UXO Lao and there is an apparent tendency to avoid using the ETS process to release land. This apparent tendency is represented by the dotted line in the flowchart in Figure 22 above. There appears to be two possible explanatory variables for this. Firstly, there is a common theme appearing through this evaluation process that UXO Lao (in common with many bureaucracies) is risk-averse, and therefore the various (and, in this case, mainly expatriate-driven) suggestions to increase outputs by accepting some form of risk do not sit well within the management culture of UXO Lao. This is exacerbated by the fact that there is no need to do so in terms of UXO Lao's ability to meet its current targets: therefore they might prefer to clear (or at least sample) even the lowest-probability targets "just in case". The second possible explanatory variable in this regard is that, given that UXO Lao has its targets to meet, and these are currently only expressed in terms of hectarage, it might appear to be quite beneficial to clear these low probability targets as these are, in some aspects, easier to clear.

This being said, it is important to establish some sort of screening procedure that defines a requirement from that in the original Level One Survey⁴⁷ and/or requests from beneficiaries, given a desire to avoid clearing land that has either no UXO in it or which will not actually be used afterwards. Prioritization processes can help deal with the second, whereas analysis of the likelihood of contamination can deal with the first. Given the unwieldiness of existing planning processes, this needs to be something simple.

If the desk assessment phase of the ETS is to be effective in releasing land, four things need to be done. Firstly, the risk implications need to be quantified, so that decision makers can truly appreciate the implications of accepting a land release process. Secondly, the management of UXO Lao will need to be indemnified for using the process; at the very least the ETS procedures will need to be approved by the NRA accreditation process (which is another incentive for UXO Lao to expedite its application for accreditation). Thirdly, UXO Lao must be provided with some sort of incentive in terms of targets to actually apply (a version of) ETS as a land-release mechanism. Fourthly, the relative costs and benefits of

⁴⁷ 'Living with UXO,' Handicap International 1996-97.

ETS-released land should be more clearly understood and explained, so that the product can be clearly differentiated from full clearance and so that customers of UXO Lao are aware of what they are paying for.

There may however be a simpler, middle ground that UXO Lao management could consider, at least in the short term until the risk implications can be quantified. This would be to use the desk assessment stage of the ETS process as a part of a *prioritization* mechanism rather than as a *land release* mechanism. In other words, land that is thought unlikely to be contaminated is simply put further down the list of jobs to do; no binding statement is made as to its status (and therefore no liability is incurred) and attention can then be focused on clearing land that is (a) believed to be contaminated and (b) is of suitable socio-economic benefit. The survey capacity within UXO Lao could be used to gather data to this regard if necessary, if it is felt that something more than a desk study is required, but a sampling process should not be necessary if one were simply prioritizing rather than releasing. Annex 5 shows a developed flow chart for a more comprehensive technical survey and land release process.

In the mid-term, there are a number of alternative mechanisms that could be employed to quantify the risk issues to allow land release. These are summarized in Annex 6.

Quality assurance and quality control

UXO Lao has a quality management (QM) cell and an expatriate technical advisor (TA) for quality management. In addition, the UNDP STA has a role, defined in his terms of reference, to ensure that “the policies and procedures developed...are consistent with International Mine Action Standards”. The QM cell reports directly to the Director to maintain its independence. The QM advisor is provided as an in-kind contribution from Armor Group (funded by the US State Department). The QM manager’s post in UXO Lao is vacant but they have recently hired a QM ‘technician’. The QM technician has no qualifications in either quality management or EOD, so a considerable amount of work will have to be put in place to develop his capacity, though as capacity development is the main function of the QM advisor this should be feasible in the longer term. There is, however, no independent QM capacity within UXO Lao at present⁴⁸. The Evaluation regards this as a significant shortfall.

There are also issues with the techniques used by UXO Lao at the level of quality control (QC), which in this context means the post-clearance sampling of cleared land. UXO Lao does include a requirement for all junior managers (up to SEOD) to sample a proportion of the UXO clearance work, and where expatriate TA exist they sometimes do the same. It is understood that when this sampling is carried out, using the same bomb locating equipment as used by the clearance personnel, a metal detector indication is excavated to determine if it is indeed a UXO (with half-a-bombie being used as the minimum target). If it is not a bombie this indication is not regarded as a quality failure. In the opinion of the Evaluation Team this is a mistake: as described elsewhere in this report a post-clearance sample is a sampling of the clearance *process*, not of the results, and therefore any such indication should be considered a quality failure, as the person doing the clearance should have investigated the indication.

⁴⁸ It is understood that there is a QA/QC function within the provinces in the form of the Senior EOD officer (SEOD), but as the SEOD reports to the provincial coordinator he cannot be regarded as independent.

The Role of the STA. The terms of reference for the STA set out tasks that are broadly in the category of capacity development. One exception to that general rule is his role to “coordinate and monitor all TA assistance.” It is not clear whether this role covers all TA provided by UNDP or all TA provided to UXO Lao. If the latter is the case, it is not clear that the STA is able to effectively carry out this function. For example, it is understood that there is no technical assistance plan for Xieng Khouang, despite repeated requests and examples of such a plan provided to JMAS, as well as being included in the service agreement.

The larger question that arises is whether the STA should have any operational responsibility for quality control over programme management and more specifically financial management. Whilst the team is convinced that the current STA does monitor field activities as far as his timetable allows on an informal and ad hoc basis, there appears to be no formal requirement for him to conduct substantive or financial oversight activities on behalf of the donors. Furthermore, the informal TA group within UXO Lao is not constituted to provide any independent monitoring function. Given the large amounts of cost sharing funds contributed to the programme, adding oversight responsibilities to the TOR of the STA would appear to be a prudent measure to ensure accountability.

Efficiency

At first glance UXO Lao is efficient, when compared to other agencies active in the UXO sector in Lao PDR. However, UXO Lao, with the assistance of UNDP who provide financial management assistance (and who have a fiduciary oversight role on behalf of their donors⁴⁹) has several advantages that allow them to be cheaper than their competitors. Some of these advantages are ‘fair’ whilst others are less so, although it is important to stress that no hint of malpractice or deliberate unfair action was observed by, or reported to, the Evaluation Team. This is merely a question of how to capture and attribute costs in order to establish a fair price for services. Whilst it is often said that “costs are a fact. Price is a policy” there are significant differences in the way that accountants and economists establish costs, and it is felt that these differences are at the root of the problem. The main costing issues identified by the Evaluation Team are discussed below.

Genuine advantages

Firstly, it is helpful to consider some of the reasons why UXO Lao may indeed be genuinely more efficient than their competitors. They are large, and should therefore be able to gain the benefits of economies of scale in terms of the distribution of their overheads onto the cost of their products. Secondly, they have been established a long time and have ‘incumbent advantage’ compared to relative newcomers to the UXO sector in Lao PDR. These are appropriate advantages of which UXO Lao should undoubtedly maximize the benefit.

Technical assistance

A technical advisor (TA) represents a cost to a UXO clearance program (one of the Evaluation Team members has calculated in previous work that each expatriate TA can contribute a cost of several cents per meter squared on clearance output). Whilst UXO Lao has fewer expatriate advisors than before, and whilst most of their work is focused and time-bound with appropriate work plans that should allow them to exit when their work is complete, these TA represent an economic cost to a project even if they are provided “free of

⁴⁹ However, the team notes that the technical advisor for finance within UXO Lao is provided on a bilateral basis by the US Department of State.

charge” as an in-kind contribution, because at some point someone is paying for them, even if the money does not go through UXO Lao’s books. For example, this may particularly significant in the case of technical assistance provided to UXO Lao by MAG, which does not appear as a cost to UXO Lao but appears as a cost to MAG, thus having a double impact on a comparison between UXO Lao and MAG in particular. UXO Lao’s competitors have to account for the costs of their expatriates directly and this may therefore be one reason whilst UXO Lao appears cheaper than the competition.

Capital Equipment

A second issue is the treatment of equipment. Equipment purchased for the use of a project such as UXO Lao, even if it is donated as a free gift to the project, has an economic cost that should be taken into account when making price comparisons. Furthermore, this equipment wears out or becomes obsolete and must be replaced. An organization that is fully responsible for its own budget will have to factor in these replacement costs as part of its pricing policy. An organization that is dependent on periodic donations of equipment might not, again allowing it to appear competitive (at least until they need the donation of the new equipment).

Treatment of overheads

It is also important to consider how to treat the cost of overheads. An overhead is commonly defined as “a cost that cannot be attributed directly to a specific product of the organization”. In the case of UXO Lao three products can be identified:⁵⁰

- Clearance of land suspected of being contaminated by UXO (allowing its subsequent safe productive use)
- Disposal of UXO by roving teams (which removes a hazard but does not clear land)
- Provision of community awareness (which is intended to reduce risk through the modification of behaviour)

The purchase of a new mine detector might be considered as a cost that can be attributed directly to the first of these products, whereas the cost of an administrator or a regional coordinator has to be shared amongst all of the products. There are a number of ways in which the cost of overheads might be apportioned, but the Evaluation Team favors the use of a form of “activity based costing” which allocates overheads proportionately by their share of the operational budget. For example, for a project that costs \$1,200,000 per year including overheads of \$200,000, with operational expenditure that has \$800,000 spent on area clearance, \$100,000 spent on roving teams and \$100,000 spent on community awareness, 80% of the overheads would be allocated to the clearance component, increasing its net cost to \$880,000. Thus, simply by apportioning the overheads appropriately instead of leaving them as a separate budget component, this results in a 10% increase in the apparent cost of clearance (although the actual cost is not increased, it is merely being reported more accurately).

Comparative advantage in MOU processes

The lengthy MOU process for non-governmental agencies entering the UXO Sector (amongst others) is a significant cost driver, according to NGO managers and donor representatives. MOU have to be re-applied for when projects are extended and when NGOs are asked to move into another geographical area, even when there is no change in the type of service being provided. These MOU application processes are complex and time consuming. Funds

⁵⁰ Note the clauses in brackets, which help identify the potential outcomes of these products.

that are already mobilized cannot be expended, but the cost of overheads must still be met during delays between application and implementation, thus driving up the eventual costs of services. UXO Lao does not face these issues and so appears more competitive, whereas the MOU process can be considered a form of ‘restrictive practice’.

Type of land

The following general principles are held to apply:

- Land that is further away from the centre takes longer to reach and is harder to re-supply, driving up costs
- Land that is heavily forested is harder to search for UXO than land that has been cleared of vegetation
- Land that is on undulating terrain is harder to clear than flat land
- Larger pieces of land are faster to clear than a package of smaller pieces that have the same combined area.
- Land that has less UXO is faster to clear than land that is heavily contaminated.

However it can also be said that the ‘easier’ land is going to be more productive and therefore should indeed be a higher priority for clearance. The Evaluation Team witnessed UXO Lao clearing just such a piece of land which was certainly ‘easy’ by the above definitions but also clearly valuable, as was demonstrated by the speed by which the locals move in to plant vegetables on it as soon as each block was cleared (see Figure 24 below).



Figure 24. The local population have already started preparing this land for planting, even as UXO Lao people continue to work on the site.

UXO Lao are also responsible (at least to some extent) to Provincial and District authorities, and as such are not entirely free to choose the easiest land. If an objective prioritization

process results in the identification of ‘easier’ land, then it is unfair to complain that UXO Lao reap the benefits in terms of higher efficiency gains from clearing this ‘easy’ land. What this might indicate is that there is a form of specialization in the UXO sector which might be appropriate from a strategic perspective but would make it harder to compare ‘like with like’ in terms of costs per square metre. The question of whether or not the prioritization process is optimized is discussed in the section on ‘impact’ above.

In the question of the existence of contamination, there are a number of somewhat contradictory factors at play. Firstly, there is a strong argument in terms of effectiveness that what matters is the release of suspect land where the suspicion of UXO is actually preventing use of that land. This makes sense as a general principle but it actually depends on whether the suspicion of the presence of UXO is indeed preventing land use. The Evaluation Team has heard that whilst land is sometimes not use because of fear of the presence of UXO, sometimes it is used, even when UXO is known to be present, so this issue is more complex than what might be first assumed. One of the primary aims of any technical survey process should be to confirm the presence of UXO at a potential clearance site. Technical survey by UXO Lao is discussed above in more detail. In any event, UXO Lao data reports that nearly 100% of their task sites contained UXO.

Benefits of better cost capture

Apart from improving the ability to compare prices across the sector, adoption of a robust cost capture process by UXO Lao will eventually help it to become more competitive, as it will facilitate the identification of ‘cost drivers’ and help focus management attention on the reduction of these drivers and thus overall costs. Furthermore, the creation of a level playing field will also help UXO Lao play to its strengths (i.e. size and experience) and help discount any unwarranted complaints about the relative cheapness of its products. The development of a better cost capture process, supported by the financial oversight from UNDP⁵¹, will ensure that any costs quoted by UXO Lao will be credible.

Sustainability

UXO Lao is referred to as the “national UXO clearance program” which implies sustainability when compared with the other actors in the UXO sector in Lao PDR. However, given that it is effectively 100% foreign funded, UXO Lao is *not* sustainable, in that it would not be able to continue after external funding ends. However, in general, this is not as much of a problem as it first sounds. As discussed in Chapter 2 of this report, it is possible to see much of the UXO contamination problem in Lao PDR as a finite issue suitable to ‘projectization’ and if UXO Lao is seen as a service provider contributing to the removal of this finite problem then there is little need for UXO Lao itself to be sustainable. In the context of UXO contamination in Lao PDR, it is the *product* of UXO clearance and related activities, i.e., the safe use of land previously (believed to be) contaminated, that one should consider as sustainable, rather than the *process* of clearance or the *organization* used to achieve it. Therefore, it could be considered as both acceptable and appropriate for UXO Lao (along with the other clearance agencies) to be wound up once the bulk of the economically significant land has been cleared, leaving behind a residual capacity fully funded by the Government of Lao PDR. Chapter 2 provides some suggestions as to how this point might be determined.

⁵¹ One donor has complained to the Evaluation Team about the relatively high costs and limited depth of their routine audits of KPMG, and it has already been noted in this report that the technical advisor for finance in UXO Lao is not provided by UNDP, so it is not yet clear that UNDP are fully meeting this requirement.

There are three significant potential exceptions to this principle, which form the basis for a requirement for such a residual capacity. These are described below.

- Firstly, there is a need for an archive of cleared areas, so that, as Lao PDR continues to develop, it is possible for people to determine whether the land they want to use was exposed to UXO contamination and whether or not it was subsequently cleared. Given the longevity of UXO found in Europe left from the First World War, this function will be important for some time to come.
- Secondly, there will be a need for some area clearance capacity to deal with emerging needs that were not foreseen at the scoping process or during the time when international funding was available.
- Thirdly, there will be a need for a roving EOD capacity able to respond to reports of isolated UXO. Again, given the experience in Europe, this will be a requirement for some time to come.

Nevertheless, it is not clear that UXO Lao in its current configuration is the best organization to meet these long-term requirements. In the short to medium term, the national database function has been absorbed by the NRA (itself unsustainable if judged by the same criterion of its dependence on international funding). The National Geographical Service might be the best archive for this data in the long term.

In the cases of an area clearance capacity and a roving EOD response capacity, the dependence of UXO Lao on foreign funding again puts into question its ability to meet these sustained needs. Whilst it is hard to deny that the men and women of UXO Lao who daily face the hazards posed by UXO deserve their current salaries, it appears unlikely that the Government of Lao PDR will be able to afford the cost of current salary scales especially at the current size of UXO Lao. However, it is possible to ‘projectize’ the bulk of the clearance requirement so that it can be done whilst donor money is available, focus on the higher priority land in the mid term and minimize the need for a residual capacity in the long term so that it is of a size and structure commensurate with the ability of Lao PDR to pay for it. Given the human and institutional capital gathered in UXO Lao, it is a prime candidate for being the basis for this sustained, residual capacity, but some hard decisions will need to be taken about its size and funding arrangements. An alternative suggestion as a locus for the sustainable, residual capacity might be within the police, as they have a national presence that would easily form the basis for a UXO reporting mechanism, and dealing with UXO could be considered a ‘public safety’ issue which is a common police role.

Conclusions

Effectiveness

UXO Lao is successfully meeting their current clearance targets as set out in the “Safe Path Forward”.

The reluctance of field staff within UXO Lao to deal with general purpose bombs is a significant impediment on their impact and effectiveness. The team notes that there is no suggestion that UXO Lao EOD personnel cannot deal with these bombs from a technical perspective. It appears to be a failure of command and control functions in that field staffs appear to be worried about the implications of a high-order detonation.

The inclusion of steadily increasing targets for hectareage in the national strategic plan is unworkable and can only lead to short-cuts being taken to meet them.

The Evaluation Team finds that the prioritization process used by UXO Lao is complicated, unwieldy and, as a result, rather unresponsive.

ETS is statistically invalid; however the use of some sort of risk management process to focus attention on the land most likely to be contaminated and of potential economic benefit is encouraged.

There is not enough QA of UXO Lao clearance, both internally and externally. The QC sampling procedures also need to be tightened to include a clear definition of what actually constitutes a quality failure.

Efficiency

The roving teams are bulky and for most of their activities this is unnecessary. Thought could be given to making the teams smaller and then combining them when they need larger numbers. This could allow more EOD teams to operate at the same time.

The surveying processes are rather inefficient and tasks appear to be visited several times before action is taken. Thought could be given to giving survey teams an EOD capacity so that they can deal with small UXO immediately.

Cost capture

UNDP are not carrying out their fiduciary role as much as they could. More thought should be given to formalizing the role of the expatriate technical advisors within UXO Lao in this regard. The contract of the STA of UXO Lao should be arranged independently of the UXO Director, in order to preserve the ability of the STA to carry out a monitoring role. Given that UXO Lao is effectively a UNDP project, the role of a non-UNDP technical finance advisor within UXO Lao should be re-examined. It might be possible to re-allocate roles between UNDP and Armor Group TA accordingly.

Sustainability

UXO Lao is unsustainable in its current status and structure. A more sustainable capacity will need to be developed to take on the residual clearance requirements once international funding has ceased.

7. Government and Donor Support: Findings and Conclusions

Findings

The Vientiane Declaration

The Government and 23 partner countries and international organizations signed the Vientiane Declaration on Aid Effectiveness on 29 November 2006 at the Ninth Round Table Meeting. The Declaration was intended to localize and re-affirm the Paris Declaration of March 2005. The evaluation mission's findings on Government and donor support to the UXO sector are reported in relation to key elements of the Declaration.

Ownership

The involvement of key Government bodies illustrates the Government's ownership in the UXO Sector by their active leadership and participation in a number of areas. These bodies and their areas of involvement are set out below.

- The Office of the Prime Minister has established the NRA whose chairman is a Deputy Prime Minister. The Minister of Labor and Social Welfare is the vice chairman and eight other representatives of concerned ministries comprise the rest of the NRA. The Office of the Prime Minister is the implementing partner with UNDP for the programme for establishment and support of the NRA office.
- The Ministry of Labor and Social Welfare has hosted UXO Lao since its creation in 1996 and continues to act as the implementing partner for the UNDP-funded UXO Lao Project. The Ministry acts as the field liaison with district and provincial government bodies for field offices of UXO Lao.
- The Ministry of Health has administers the National Rehabilitation Center with support from a number of humanitarian and donor organizations and supports similar centers operated by provincial Departments of Health. The Ministry has assumed responsibility for the medical treatment and care of UXO victims on an equal basis with any other accident victims.
- The Ministry of Education has integrated UXO risk education into primary school curriculum with support from World Education Consortium. The Ministry is committed to continuing this programme and expanding to other impacted districts with its own resources.
- MOFA has show strong leadership on Lao PDR's possible accession to the Cluster Munitions Treaty, which could have significant funding implications for UXO operations in Laos.
- Finally, numerous provincial and district government units have cooperated with and supported the field activities of various UXO operators.

On the other side of the ledger, some donors are disappointed with the low level of financial support from Government for the projects and programme activities in the sector. UXO Lao and the NRA office are almost entirely financed by donor contributions. The Prime Minister's Office and the Ministry of Labor and Social Welfare have been encouraged to seek Government budgetary allocations for the NRA office and UXO Lao, respectively.

Despite clear evidence of Government commitment to the sector, many activities in the sector have the appearance of being donor-driven. Donor support for the sector has been generous, perhaps excessively so. The NRA office has six international technical advisors. UXO Lao has eight. Donor partners have done little to coordinate the provision of these technical advisors to the NRA office and UXO Lao, resulting in a sub-optimal distribution of advisors. UXO Lao has an excess of advisors in the North and a dearth in the South. From a capacity development perspective, the presence of international technical advisors at UXO Lao has apparently inhibited fully qualified Lao EOD officers from dealing with large bombs.

Total funding for humanitarian (non-commercial) UXO clearance and related activities was over \$13,600,000 in 2007. All local personnel working for the NRA office and UXO Lao are paid by donor funds, mainly by funds channeled through UNDP. Other donors and operators in the sector provide both funds and technical supervision. With funding of this order of magnitude available, the Government has had little incentive to provide counterpart funding.

UNDP and its cost-sharing partners provide most of the funding for the two key UXO projects and the senior technical advisors for UXO Lao and the NRA office. UNDP has taken the lead in resource mobilization for UXO Lao and the NRA office and a long list of donors have contributed generously over the years for UXO Lao and recently for the NRA office.

Alignment

UXO partners are clearly aligned with the Government strategy for the UXO Sector, “The Safe Path Forward” which was issued as a decree by the Prime Minister’s Office in 2004 and with sub-sector strategies that have been subsequently jointly developed by working groups. Development partners of the Government who are only peripherally involved with UXO are another story. These partners (and commercial investors as well) have failed to adequately take into account the affects of UXO on their development activities. When they encounter UXO problems, they discover that they have not funded the costs of dealing with clearance. There is still much work to be done to integrate UXO planning into wider development efforts that require the use of contaminated land.

Another major issue in regard to alignment is that the strategy for UXO is not fully aligned and integrated with national socio-economic development and poverty alleviation strategies and their respective time frames. There is widespread recognition of the need to integrate UXO activities into mainstream Government planning. The opportunity for re-alignment will present itself during the review of the current Five Year Plan and in preparations for the next plan. Given the increased emphasis on the role of UXO clearance in poverty alleviation, the alignment and integration of UXO planning with mainstream development planning is critical.

In regard to the use of government regulations and procedures and the use project implementation units, the main actors in the sector, UXO Lao and the NRA office are both project implementation units of UNDP-funded projects. Government systems and procedures are not applied. These arrangements are legacies of the arrangements that were set up when UXO Lao was first established in 1996.

In regard to donor commitments to multi-year frameworks, the UXO sector requires particular attention. Not only does the UXO situation require a long-term approach, annual

donor budgeting for clearance activities inhibits innovation as clearance operators are forced to work from job to job without any resources for research and development or other organizational innovations. This situation is a perverse consequence of the focus on results-based management. Similarly, donor funding for small clearance projects does not attain the critical mass needed for efficient operations and should be avoided wherever possible.

In regard to the establishment of long-term sustainable capacity to address UXO issues, there are no plans currently in place. This evaluation provides recommendations for a strategy and activities to address long-term requirements.

In regard to financial management, partner agency personnel provide oversight of financial management.⁵² Hybrid financial management systems – neither donor agency nor Government – are used for the NRA office and UXO Lao as mutually acceptable standards have not been attained for the use of government financial management systems.

Harmonization and Simplification

In regard to comparative advantages, UNDP has been fairly successful in leading resource mobilization efforts for the NRA office and UXO Lao. Its fiduciary function, however, requires some clarification and strengthening. Nevertheless, not all donors have availed themselves of UNDP's services in this area, creating the need for additional financial management arrangements.

The sub-sectoral working groups on risk education, victim assistance and clearance actively encourage sharing of experience and coordination of efforts. UXO operators provide regular reports in a common format to the NRA office. The office prepares a consolidated annual report of all activities in the sector.

In regard to programme or sector-based approaches, all partners have aligned their work with the National Strategic Plan, "The Safe Way Forward". Though there are many issues with details in the strategy, it has provided a sufficient overall framework for coordinated operations in the sector since its introduction. No serious conflicts or "turf" issues were observed by or reported to evaluation mission among the operators. The demand exceeds the supply of services and service providers in the sector. In other words, there is plenty of work for everyone and the operators are able to stay out of each other's way. Given the responsiveness of partners to the Strategic Plan and the success of existing coordination mechanisms, there does not appear to be an over-riding rationale for more complicated financial planning and resource allocation in the sector under some kind of UXO sector or programme management mechanism.

In regard to simplification of procedures, an area of concern has emerged since the sector has been opened up in the last few years to enable a variety of international UXO clearance operators to work in Laos. These operators include commercial operators and non-profit, non-governmental organizations. The humanitarian assistance of this latter category of the internationally recognized clearance operators has often been extensively delayed by the process of getting a memorandum of agreement (MOU) processed through the Ministry of

⁵² Lao PDR is rated "high risk" by UNDP's in-house auditors and ranks with nine other countries at 111th on the Transparency International (TI) Corruption Perception Index. Sources: UNDP Office of Audit and Investigations (OAI), 2007 NEX/NGO Audit Exercise. Transparency International website, Data for 2005 and 2006.

Foreign Affairs. These delays have real costs and losses for the country as the use of programme funds is delayed and possibly diverted elsewhere. In addition, there are opportunity costs associated with injuries from UXO that were not cleared in an expeditious manner and loss of income from land that lay idle whilst awaiting UXO clearance. The Ministry of Foreign Affairs has taken note of this issue and is revising the MOU format and procedures. MOFA will hold a conference with concerned stakeholders later this year to obtain feedback on the proposed changes prior to their introduction.

Managing for Results

The National Strategic Plan, which pre-dated the Declaration by over two years, set some targets for results that were not backed by hard baseline or experiential data. In these cases, targets were understandably unrealistic. The data is stronger today and therefore target-setting in the next plan should be more appropriate.

Many partner organizations have adopted results-based management in their own project cycles. The next planning cycle should include linkage to national planning targets, relate to poverty alleviation, and clarify whether desired results are outputs, outcomes or impacts.

Mutual Accountability

In regard to mutual accountability, this evaluation exercise is an example of a coordinated approach to the planning and implementation of a sector-wide activity for the benefit of all stakeholders. This mission also coordinated part of its schedule of visits and field trips with a regional evaluation of UXO/ mine action activities being carried out by the European Union.

Conclusions

- Government has made important policy and operational commitments to the UXO programme but only small financial contributions.
- While UXO operators have aligned their activities with the national strategy, other development agencies have not fully integrated UXO issues into their plans.
- Unresolved systemic issues in regard to the efficacy of Government systems retard the use of Government systems and procedures.
- The sector is sufficiently well coordinated under the mechanisms (working groups) that have been put in place.
- Given the dearth of direct Government funding, donors can take a great deal of credit for the successful implementation of the key aspects of the National Strategic Plan.

8. Recommendations

The Evaluation Team makes the following recommendations based on the findings and conclusions in the chapters above.

Scoping

- A strong correlation exists between high levels of UXO contamination and the 47 poorest districts. The overall scope of the UXO clearance program should be based on the clearing of all potential paddy land likely to be contaminated and that a proportion of the potential upland cultivation should be cleared in the 47 poorest districts. With more resources, the 25 poor districts could be included as well.
- Where possible, other upland areas should be released by technical survey, if a credible survey process can be developed. Land released by survey would be faster and more cost-effective manner than achieved solely by full clearance.
- The scoping results initially indicated that the clearance of the land included above would require 16 years at current rates of clearance. This period could be shortened by a number of years 1) with the provision of additional resources, 2) further improvement of survey and clearance techniques, and 3) further refinements in the definition of contaminated land, such as, removal of land in concession areas and land already cleared from the current estimate.
- The original JICA analysis appeared to have a more exacting method of identifying the highest-potential agricultural land. The NRA office should continue to research this and other relevant land use and land cover data, perhaps through an extension of its intern program.
- Given the dynamic nature of the situation (i.e. the potential for further changes in the values of the most sensitive inputs over time), the cost-benefit analysis model should be periodically re-run to identify the effect of changes in circumstances. The NRA office could undertake this work.
- There is some discussion in the sector that it's coverage should be expanded beyond the current nine provinces currently covered. The scoping and resource allocation models developed as part of this evaluation could help establish a means of quantifying the requirement.

The UXO Sector

- Suggested Sector Themes. The structure of the UXO sector should be refined to focus on two thematic areas: 1) accident prevention and 2) area clearance of UXO.
- Accident prevention would emphasize targeted activities for groups at high risk of accidents, namely, people involved in scrap metal collection and processing and 2) people who discover UXO in the course of agricultural or other activities. The following strategies and activities are suggested:

- Expanded numbers of roving teams should first deal with the backlog of reported UXO.
- As part of the overall accident prevention theme, a public information campaign should be undertaken to encourage the reporting of UXO. Bottom up communications linkages need to be established from the village level to UXO roving teams. Village chiefs should be encouraged to use whatever communications channels are available to report dangerous items and the concerned roving team should respond within five days. The contact information for roving teams should be widely advertised.
- Roving teams should also develop partnerships with scrap metal dealers and collectors. These teams would provide 1) training and education on safe scrap handling and 2) rapid response when UXO are encountered in the course of scrap collection.
- Roving teams should provide rapid response when villagers encounter UXO in farming or other activities. The teams should respond immediately to destroy or remove these items to prevent children from playing with them or amateur attempts to defuse them.
- In accordance with the recommendations under scoping above, area clearance would continue to focus on UXO clearance of land for development and poverty reduction purposes.
- In regard to UXO clearance for family agricultural plots, there are a number of methods available for use at a provincial and district level to prioritize the requirements of individual households. These include rationing and lotteries. Research should be carried out to examine the alternatives and select the best practice for use in the Lao context.
- Quality Assurance. Within the sector, external quality assurance monitoring for UXO area clearance cover at least 5% of clearance work on a random basis. At least some of these observations should be unannounced.
- QA monitoring could be provided in a number of ways:
 - The NRA office could contract in sufficient people to meet the 5% target. This is probably the most expensive option, but some compensating reductions could be sought in other elements of the NRA staff.
 - The NRA office could let an independent contract for QA monitoring; if this were done it should involve an organization that is not in competition for clearance funding in Laos.
 - Individual donors could contract in their own independent QA monitors.
 - The NRA office could require, by regulation, that each operator is responsible for hiring in a QA monitor.
- All Quality Control sampling should be conducted on the assumption that the UXO clearance being sampled has not been fully effective and some UXO remain. The QC sampling team should therefore be trained and equipped in a manner appropriate for UXO search and accompanied by the same safety requirements.
- ETS and PCIA. The ETS desk analysis process should be used to help order priorities in the short term pending the development of an improved quantitative analysis process.

- PCIA should be a simple process included in the standard project cycle management and quality management processes within the sector, and could be as simple as a quality assurance (QA) team answering the question “is this land being used for the purpose for which it was intended?”
- Transitional Operations. Within the next two years, donor support in the sector in the areas below should transition as follows:
 - Education-based community awareness should shift to increased support for roving and targeted prevention activities;
 - Responsibility for in-school risk education should shift to MOE;
 - Responsibility for the victim assistance database should shift to MOH.

If deemed necessary, capacity assessments should be carried out to confirm the ability of the recipient organizations to manage transferred functions along with appropriate measures to ensure the sustainability of the respective functions.

The Next National Strategic Plan

The goal for preparation of the next National Strategic Plan should be the integration of UXO activities into the plans and strategies of next socio-economic development plan (2011-2015). In other words, the next plan should supersede the current plan and begin a new five-year planning period in 2011. The essence of the next plan would be incorporated into the socio-economic plan.

The main themes for the UXO sector should be 1) accident prevention and 2) UXO area clearance for development and poverty reduction.

The plan should take into account and cover these key aspects:

- The use of scoping results as the basis for planning
- The need for greater emphasis on roving tasks and responsiveness
- The need for development of a simple system of priority setting that addresses development and poverty reduction priorities
- The development of new types of targets, given the shift in emphasis to roving tasks
- An explanation of funding policies and mechanisms for the sector
- The definition of an exit or handover strategy for the NRA and UXO Lao residual functions.

The NRA and the NRA Office

- Leadership. The NRA office should expand its public relations function to include active outreach to Government offices, other development agencies and the private sector for the provision of up to date information and presentations about the UXO situation, clearance obligations, NRA policies and the activities of UXO operators.

- The NRA office should advocate for removal of provincial laws that restrict the scrap metal trade, advocate for the implementation of safe scrap handling strategies by UXO operators under the accident prevention theme, and advocate for a national regulation preventing children under 14 from participating in scrap metal collection.
- In cooperation with MPI, the NRA should advise on the establishment of a Government regulation that clearance must be undertaken in all contaminated concession or investment areas for purposes of public health and safety.
- The NRA office should negotiate within the Government the locus for residual capacity to deal with UXO disposal in the long term; mobilize resources and help formulate a plan to develop this capacity. Whilst donors might help with the development of such a capacity, its ongoing recurrent costs would be borne by the Government after the end of donor support.
- The NRA office should include the following principles in both National Standards and in policy documents for UXO clearance in support of development projects:
 - Any agency wishing to conduct a development project in Lao PDR should seek advice from the NRA office about the likely contamination.
 - Clearance should only be contracted from agencies accredited by the NRA office.
 - The technical annexes and scope of work for UXO clearance should be drafted by a competent specialist that is not involved with the clearance agency and should be compliant with National Standards.
 - Clearance contracts should be awarded pursuant to competitive bidding.
 - UXO clearance should be subjected to external quality assurance monitoring.
 - The National Regulatory Authority office can provide customers of UXO clearance with advice on how to contact technical specialists to assist in the drafting of technical annexes and assist with external quality assurance monitoring. Such technical specialists can also be contracted by competitive bidding, depending on the customer's own organizational requirements.
- Governance. The NRA should approve the National Standards for UXO clearance and arrange for publication as soon as possible.
- The NRA office should take steps to accelerate the accreditation process for clearance operators.
- The NRA office should develop and implement quality assurance monitoring up to 5% of clearance activities.
- Coordination. The NRA office should develop and apply an economically sound model for analysis of costs and prices of various clearance operators. No such model exists today in Laos.
- The NRA office should assist in the creation of a benchmarking test facility, ideally at the UXO Lao training centre. This benchmarking facility would allow organizations to measure their own likely productivity given their own equipment and procedures in a controlled environment. The test facility should consist of a number of one-metre wide lanes, each thirty metres long. The lanes should be first made "metal free" and processed to make sure that their soil contents are consistent. They should then be seeded with a

known level of contamination both in terms of depth, object size and density of contamination per square metre. It is recommended that four sets of four 30m lanes be prepared, with each set consisting of:

- 1 x lane with no metal contamination (control lane)
- 1 x lane with average density of 1 indication per m²
- 1 x lane with average density of 5 indications per m²
- 1 x lane with average density of 10 indications per m².

The lanes should be at least one metre apart to allow for the use of larger detection systems (such as the Ebinger 'Large Loop') and to prevent confusion from signals from other lanes.

- Organizational Issues. The NRA office should develop a plan for determining capacity development requirements and the planned reduction of the number of technical assistance advisors.
- In general, the NRA office should anticipate irregular funding and therefore constantly seek to reduce optional costs. Suggestions for cost reductions, some of which have already been made, include:
 - Regular review of staffing and personnel needs;
 - Transferring the victim database and related data collection network to the Ministry of Health or the National Rehabilitation Center;
 - Simplify the post clearance assessment process so that it can be carried out as an aspect of project cycle management;
 - In lieu of creating provincial offices, consider providing necessary services on a visiting basis.
- Given the time bound nature of the UXO problem, the NRA office should remain as a programme of UNDP and the Government.
- The functions of the NRA office should be defined as follows:
 - a. Act as Secretariat of the NRA.
 - b. Prepare requests for Lao Government budgetary support.
 - c. Draft policy and resource allocation strategy on UXO area clearance and accident prevention; this function does not extend to day to day tasking of operators.
 - d. Prepare and review of sectoral plans that are to be integrated into national socio-economic plans.
 - e. Accredite UXO clearance operators.
 - f. Manage a database on contaminated land and land clearance.
 - g. Monitoring of UXO operators and their compliance with sectoral plans
 - h. Carry out quality assurance monitoring on behalf of stakeholders.
 - i. Report to the NRA and stakeholders on UXO plans, activities and results in the sector.
 - j. Prepare and revise standards.
 - k. Conduct research into relevant UXO-related issues (such as, the development of a sound costing model as recommended above).
 - l. Coordinate and share information among UXO operators.
 - m. Act as an administrative interface between UXO operators and relevant government ministries, on issues such as MOU.
 - n. Represent the Government at international meeting and events dealing with UXO and related matters.

UXO Lao

- Roving. Roving tasks should be the first priority of UXO Lao and work should be undertaken to clear the backlog of EOD tasks. Roving teams should also respond to UXO found by scrap collectors and processors.
- The importance of roving tasks should be recognized as part of an overall accident reduction concept and a response time analysis process should be adopted to ensure that such tasks are dealt with in a timely manner. A recommended maximum response time is five days between reporting and clearance of any single item of UXO. If this response time cannot be achieved, more roving teams should be established. Roving EOD teams should be reallocated across provinces to ensure that response times are equitable over all of Lao PDR.
- Field staff need to be encouraged to deal with general purpose bombs in a timely manner; if there are indeed no technical problems, in terms of training or equipment faced by the EOD teams then appropriate managerial safeguards need to be put into place to give the field staff confidence that they can discharge their jobs without fear of inappropriate disciplinary action providing they follow approved procedures. Senior management of UXO Lao should investigate the reasons for the hesitancy to deal with these munitions and take action accordingly.
- Reporting and surveying processes should be streamlined to minimize the number of times a task is visited. In the case of single items of UXO, survey and/or EOD teams should be trained and equipped to deal with UXO 'on the spot' wherever possible. Thought should also be given to reorganizing roving teams into smaller units to allow more teams to be on the ground for the initial response and survey process. It could then be possible to combine these smaller teams where larger groups are needed to cordon off demolition sites.
- Community Awareness. Some Community Awareness personnel should be redeployed with roving teams and their jobs reconfigured to communicate messages for 1) safe scrap collection among scrap collectors and processors and 2) UXO accident prevention in land clearing and agriculture. They should communicate the message of how to report UXO as part of an overall accident prevention concept. Other CA personnel could be re-trained as roving EOD team members.
- Area Clearance. Area clearance by UXO Lao should focus first on the clearance of unfunded public works projects identified by local government and then on the clearance of agricultural land where suitable land tenure arrangements exist and the beneficiary is likely to be able to make use of the land. Family agricultural plots should be cleared only when no higher priority public good projects are pending. This work should be free at the point of delivery. UXO Lao should work with NRA and MPI to develop appropriate policies linking poverty reduction and clearance, such as, concentration of clearance efforts on the 47 poorest districts.
- UXO Lao should set overall criteria for prioritization in line with national priorities, and then allocate resources between provinces on an equitable basis. The detailed task of prioritization should be delegated to provincial coordinators. UXO Lao would then only

be required to monitor compliance with national requirements. This should free up the prioritization process. Provinces should be encouraged to generate six-monthly or even quarterly works plan, thus making them more responsive to requests for clearance.

- The work plan of UXO Lao should be freed up to allow more detailed prioritisation to take place at a provincial level. National involvement should be limited to setting overall criteria for intervention, allocating resources between provinces and then following up to make sure that work is carried out in accordance with the agreed criteria.
- UXO Lao should stop the automatic increase of production targets in terms of hectareage; instead they should introduce a reasoned, objective and transparent mechanism to forecast an average annual production rate as *part* of a more sophisticated system of indicators that focuses on outcomes and outputs rather than on activities.
- UXO Lao should continue to look for opportunities to make further gains in efficiency through the adoption of new techniques and/or appropriate new technologies.
- Survey. The current ETS field sampling process of 25% of a potential clearance task has yet to be statistically validated and should be suspended pending its formal quantification.
- The ETS desk analysis process should be used to help order priorities in the short term pending the development of an improved quantitative analysis process; ideally this should be based on the Oxiana model or an 'open source' equivalent. If a quantitative analysis process is desired as a field sampling complement to the desk analysis, then the concept of fragment sampling should be investigated. The results of this investigation should be made available to all UXO clearance operators in Lao PDR.
- Quality Assurance and Quality Control. More quality assurance (QA) monitoring of UXO Lao operations should be conducted, with at least 5% of UXO clearance activities being observed on a random and unannounced basis. QA should be conducted internally by UXO Lao management and externally by NRA, though donors should not be discouraged from the use of their own monitors.
- The internal quality control sampling (QC) processes inside UXO Lao should be reviewed to ensure that the finding by a QC inspector of any indication (by a detector calibrated to find a half-BLU 26 and fuse), and where the indication has clearly not been investigated by clearance personnel, should be considered a quality failure, even if that indication is not actually an item of UXO.
- Organizational Issues. UXO Lao should proceed with accreditation by the NRA office as soon as possible.
- If UXO Lao is asked to tender for area clearance services on an infrastructure or development project, it should not do so until UXO Lao has a cost-capture process in place that will allow the organization to identify its true costs. Conversely, once they have such a process they should be encouraged to tender for such projects. Given that donations of funds and equipment have been provided for humanitarian purposes, UXO Lao should not bid on commercial projects.

- Given the time bound nature of the UXO contamination problem and as in the case of the NRA office, UXO Lao should continue as a project of the Government and UNDP. Other donors contributing funds to UXO Lao should channel them through UNDP or set up their own project implementation units to administer their resources.
- The fiduciary role of UNDP advisors in financial management and their management role in quality assurance should be clarified and strengthened. The contract of the STA should be amended to reflect this and his contractual independence from the Director of UXO Lao should be strengthened.
- UNDP should consider expanding the scope of work for audit of UXO Lao to include not only compliance but also management performance and value for money as well.
- UXO Lao should assist in the development of a residual national capacity through its training centre. UXO Lao staff should be encouraged to join this capacity at the end of the UXO Lao program.

Government and Donor Support

- The Ministry of Foreign Affairs should undertake a major reform of the MOU process. Streamlining that process could immediately and dramatically increase funding available for the sector. Assuming an average processing time at present of six months per MOU – an underestimate according to concerned parties – and using the total UXO programme expenditures of \$6.0 million for the three largest non-governmental organizations in 2007, the opportunity costs of six months' delay is estimated at \$3.0 million – half of a year's total delivery of area clearance and other UXO services.
- There is a clear indication amongst donors that a significant cash contribution (i.e. above and beyond the current 'in kind' contributions) to the UXO sector by the GOL would be an important signal that could help unlock additional donor funding. Discussions with stakeholders suggest that a figure comparable to the recurrent costs of the NRA Office (i.e. approximately \$500k per year) would be a welcome start.
- In order to harmonize technical assistance and capacity development, the technical working group for the UXO sector should address the issue of the actual needs for technical advisors at the NRA office and UXO Lao and advise donor organizations accordingly. The roles of the UNDP STAs at the NRA office and UXO Lao should be recognized by other donors as playing the coordinating role for technical assistance.
- Following the lead of AusAID in its Lao-Australia NGO Cooperation Agreement (LANGOCA) Program, other development agencies working in Laos should fully fund the costs of any necessary UXO clearance for development projects in their planning and budgeting processes.
- Funds should be allocated to the Poverty Reduction Fund and the District Development Fund to allow them to fund their own clearance requirements. These Funds should avoid tendering for small jobs, however, and should design contracts for a total number of hectares per year in order to take into account clearance operators' needs for economies of scale.

- The Government, in cooperation with the NRA office, should decide where the locus of residual capacity for UXO disposal should be and begin the process of capacity development to establish that capacity within the Government.
- If accession to the Oslo Convention on Cluster Munitions results in the mobilization of large amounts of additional resources, there may be a case for the establishment of new funding arrangements for the sector to facilitate donor coordination.

Annex 1: OECD Development Evaluation Criteria

| No. | Criterion | Definition | Rule of Thumb |
|-----|----------------|---|---|
| 1 | Relevance | The extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor | Does it fit development and/or poverty reduction plans? |
| 2 | Impact | The positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended. This involves the main impacts and effects resulting from the activity on the local social, economic, environmental and other development indicators. | Does it have a positive effect on the intended beneficiaries? |
| 3 | Effectiveness | A measure of the extent to which an aid activity attains its objectives. | Does it meet its targets? |
| 4 | Efficiency | Efficiency measures the outputs -- qualitative and quantitative -- in relation to the inputs. It is an economic term which signifies that the aid uses the least costly resources possible to achieve the desired results. This generally requires comparing alternative approaches to achieving the same outputs, to see if the most efficient process has been adopted. | Does it meet its targets in a cost-effective manner? |
| 5 | Sustainability | Sustainability is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. | Will the government take on funding? |

Annex 2: EOD Resource Allocation⁵³

This method is based on an approach used by a number of countries, including, for example, Australia and the UK. Under such an approach, an average response time is set as a standard by the appropriate authority. This would be the expected time between a UXO being reported to the implementing agency and its team arriving to deal with the suspected item.

Given the time necessary to deal with an ‘average’ find after the team arrives on site, and typical travel times between two separate locations, one could expect each team to deal with two separate UXO tasks each working day. This then allows analysis using the principles set out in Box 1 below.

- *If EOD teams are each carrying out an average of two tasks per day and there is no backlog of tasks, then the number of teams available can be considered sufficient and their management efficient*
- *If EOD teams are carrying out an average of two tasks per day and there is a backlog of tasks, then the number of teams available may be insufficient, even if they are being managed efficiently*
- *If EOD teams are carrying out less than two tasks per day and there is no backlog of tasks, then there may be too many teams available (or a problem in the task reporting process)*
- *If EOD teams are carrying out less than two tasks per day and there is a backlog of tasks, then it is likely that the teams are being managed inefficiently.*

Box 1. Principles for EOD response time analysis.

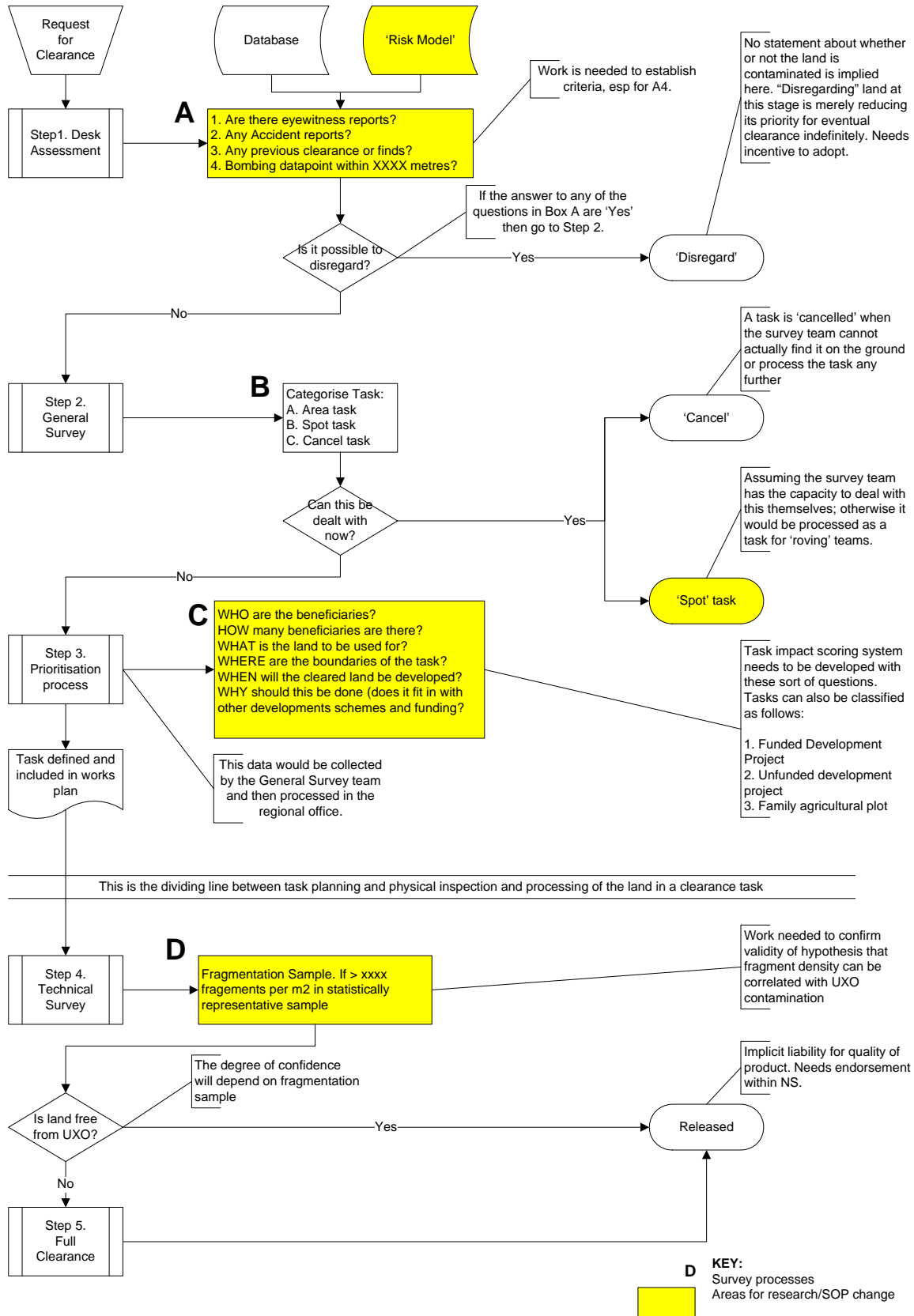
This analysis can be carried out at a national level to determine whether there are sufficient EOD teams in the country, and repeated at a provincial level to establish whether the capacity is allocated efficiently between provinces.

⁵³ These principles were originally set out in an evaluation of the mine action sector in Cambodia carried out on behalf of UNDP in 2004 by two of the members of this Evaluation Team. See: Robert Griffin and Robert Keeley “Joint Evaluation of Mine Action in Cambodia” 2004

Annex 3: UXO Lao Planning Score Sheet

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | | |
|----|---|---|---|---|----------|---|---|---|----------------------|---|---|---|---------|---|---|---|----------|---|---|---|-------------|--|--|
| 1 | Selection and Prioritisation of Clearance Tasks | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Section - 1 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Village | | | | KENGKOUA | | | | Village Code | | | | 1305445 | | | | Province | | | | SAVANNAKHET | | |
| 4 | Area (sq. m) | | | | 30000 | | | | No. of Beneficiaries | | | | 15 | | | | District | | | | PHINE | | |
| 5 | Task Code | | | | | | | | Task type | | | | | | | | | | | | | | |
| 6 | Section - 2 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Points | | | | | | | | | | | | | | | | | | | | | | |
| 8 | A The impact of UXO in this village is rated as follows in the 1997 Impact Survey Report | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Severe <input type="checkbox"/> Significant <input checked="" type="checkbox"/> None <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 10 | OK GO TO B1 | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | B Casualty recorded in the village | | | | | | | | | | | | | | | | | | | | | | |
| 13 | In the last two years | | | | | | | | | | | | | | | | | | | | | | |
| 14 | B1 | | | | | | | | | | | | | | | | | | | | | | |
| 15 | 1-3 <input type="checkbox"/> 4-6 <input checked="" type="checkbox"/> 7 or more <input type="checkbox"/> None <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 16 | OK GO TO B2 | | | | | | | | | | | | | | | | | | | | | | |
| 17 | B2 Since 1973 | | | | | | | | | | | | | | | | | | | | | | |
| 18 | 1-3 <input type="checkbox"/> 4-6 <input checked="" type="checkbox"/> 7 or more <input type="checkbox"/> None <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 19 | OK GO TO C1 | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | C1 Are there any bombing records for this village in US-provided database information? | | | | | | | | | | | | | | | | | | | | | | |
| 22 | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 23 | OK GO TO C2 | | | | | | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | C2 Has there been any ground battle in this area | | | | | | | | | | | | | | | | | | | | | | |
| 26 | Yes <input type="checkbox"/> No <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 27 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 28 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 29 | D National Growth and Poverty Eradication Strategy (NGPES) | | | | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | The village is listed as a priority village | | | | | | | | | | | | | | | | | | | | | | |
| 32 | The village is not listed as a priority village but the district is | | | | | | | | | | | | | | | | | | | | | | |
| 33 | Neither the village nor the district is listed | | | | | | | | | | | | | | | | | | | | | | |
| 34 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 35 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 36 | E1 Contamination level based on previous clearance carried out in this village | | | | | | | | | | | | | | | | | | | | | | |
| 37 | Less than 3 UXO hectare <input type="checkbox"/> 3-9 UXO hectare <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 38 | More than 10 UXO hectare <input type="checkbox"/> No UXO contamination <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 39 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 40 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 41 | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | E2 Number of roving visits made in this particular village | | | | | | | | | | | | | | | | | | | | | | |
| 43 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 44 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | F Number of beneficiaries benefiting from the clearance task per hectare | | | | | | | | | | | | | | | | | | | | | | |
| 48 | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 49 | OK GO TO G | | | | | | | | | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | | | | | | | | | | |
| 51 | G Nature of task (refer National Strategic Plan - The Safe Path Forward) | | | | | | | | | | | | | | | | | | | | | | |
| 52 | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | Priority 1: Agricultural tasks, public service utilities, educational facilities | | | | | | | | | | | | | | | | | | | | | | |
| 54 | Priority 2: Grazing land and forested areas, communal facilities, government facilities and offices | | | | | | | | | | | | | | | | | | | | | | |
| 55 | Priority 3: Public infrastructure work, communal 'profit-making' areas, tourism sites, commercial private business sites | | | | | | | | | | | | | | | | | | | | | | |
| 56 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 57 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 58 | | | | | | | | | | | | | | | | | | | | | | | |
| 59 | H Development projects relevant to the task site | | | | | | | | | | | | | | | | | | | | | | |
| 60 | None <input type="checkbox"/> On-going <input type="checkbox"/> Planned <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 61 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 62 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | | | | | | | | | | | | |
| 64 | I Information from the beneficiary | | | | | | | | | | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | | | | | | | | | | | |
| 66 | I1 Land is not used but will be used soon after it is cleared and it is not known if UXO is in this land or not | | | | | | | | | | | | | | | | | | | | | | |
| 67 | Land is being used and it is known that some UXO are still in the land | | | | | | | | | | | | | | | | | | | | | | |
| 68 | Land is being used and it is not known if any UXO is still there | | | | | | | | | | | | | | | | | | | | | | |
| 69 | Land is not being used but will be used soon after it is cleared. Also there are many UXO known to be in this land | | | | | | | | | | | | | | | | | | | | | | |
| 70 | Land is not being used but will be used soon after it is cleared and some UXO are known to be in the land | | | | | | | | | | | | | | | | | | | | | | |
| 71 | Land is being used and it is known that many UXO are still in the land | | | | | | | | | | | | | | | | | | | | | | |
| 72 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 73 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 74 | | | | | | | | | | | | | | | | | | | | | | | |
| 75 | I2 Resources are available to use the land once it is cleared | | | | | | | | | | | | | | | | | | | | | | |
| 76 | Yes <input type="checkbox"/> No <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 77 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 78 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 79 | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | I3 When will work start once the land is cleared | | | | | | | | | | | | | | | | | | | | | | |
| 81 | Immediately <input type="checkbox"/> Within 3 months <input type="checkbox"/> 3-6 months <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 82 | 6-12 months <input type="checkbox"/> More than 12 months <input type="checkbox"/> Don't know <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | |
| 83 | CHECK YOU MIGHT HAVE TICKED MORE THAN ONE BOX OR NO BOX | | | | | | | | | | | | | | | | | | | | | | |
| 84 | ERROR | | | | | | | | | | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | | | | | | | | | | | |
| 86 | J Total | | | | | | | | | | | | | | | | | | | | | | |
| 87 | 43 | | | | | | | | | | | | | | | | | | | | | | |

Annex 4: Recommended revised Technical Survey structure



Annex 5. Alternative UXO Risk Assessment Methods

Risk and Hazard

- A *hazard* is defined as something with the potential to cause harm.
- *Risk* is considered in its formal sense as the product of the severity of an adverse outcome created by a particular hazard and the probability of its incidence.
- Where the probability of incidence is directly affected by the activity of people or institutions using a particular piece of land, risk can also be considered as a function of hazard and activity.

Box 2. Definitions of hazard and risk

*GICHD Risk Model*⁵⁴

One of the Evaluation Team members recently had the opportunity to examine the latest version of the software associated with the GICHD risk model and discuss it with the GICHD staff member currently assigned to develop it. The software, when and if it can be completed, offers the potential for assisting Lao PDR allocate its scarce UXO resources through a principle of risk management rather than attempt to clear all of the potentially contaminated areas. Unfortunately, as the GICHD staff member agreed, there are several significant problems with it at present. It is therefore not available for use in the short term. There has been no independent validation of the formulae used in the model, and the model is therefore a ‘black box’. Furthermore, the formulae include a number of coefficients which effectively weight the mathematical operations of the model. These coefficients appear to be set arbitrarily (at least, the rule set for their application is not apparent) and were done so without consultation in the UXO sector in Lao PDR. Even when (or if) the model is finalised it will not deal with the apparent problem addressed in the ETS process of demonstrating physical evidence of the land.

Oxiana Risk Model

There is an alternative ‘risk’ model which is being discussed for use in the Sepon gold mine by Lane Xang Minerals Limited (LXML). The model is sometimes referred to as the ‘Oxiana’ model due to its links with the Australian element of the LXML consortium. It is understood that this model measures the probability of UXO being found in a given distance from one of the data points from the US bombing data. Given the high number of data points available, it seems reasonable that statistical modelling should be able to allow a potential user to say something like “there is 95% confidence that all UXO are found within X hundred metres of the nearest data point”. This, once established, would allow a comparatively simple risk-benefit analysis to be undertaken and could lead to an effective mechanism for releasing land that has a low probability of contamination⁵⁵. Unfortunately the Oxiana model is not available for general use in Lao PDR at present. The Evaluation Team understands that it is still under development and that LXML are not yet actually employing it. If LXML are subsequently unwilling to release a completed version of the model for commercial reasons⁵⁶,

⁵⁴ Lao PDR Risk Management and Mitigation Model, GICHD, February 2007.

⁵⁵ Note that the product of this (or indeed the other risk assessment processes) is not ‘low risk’ land, as even land that has a high probability of contamination only becomes ‘risky’ as a result of human activity on that land.

⁵⁶ If the Oxiana model is ever finalized and used by LXML, there is a case to be made that the NRA office should have full visibility of its function in order to establish whether or not it is producing a product acceptable within Lao PDR; this is entirely feasible within the roles of the NRA.

then it should be possible for a third party to develop a similar process, given that LXML hold no patent on either the rules of statistics or the US bombing data. The main disadvantage of the Oxiana model is that whilst it would help the desk analysis described above it does not provide a physical check of the potential clearance task as a confidence-building measure. It also shares a common problem with the GICHD in that by concentrating on the bombing data it is really a measure of *hazard* rather than *risk* (see the definitions in Box 2 above).

Fragmentation sampling

One of the members of the Evaluation Team has previously investigated a possible alternative process by which survey teams would test an area for a higher-than-normal density of metal fragmentation contamination. The central premise of this hypothesis is that land that has been bombed or fought over will have a higher proportion of metal fragmentation than land that was not bombed or fought over, and given that UXO only exist in such land (as a percentage of the total amount that was dropped or fired) a high fragment level will be a strong indicator of the presence of UXO. It is further hypothesized that, given that this alternative survey process would be looking for indications amongst a large fragment 'population' (there are more items of fragmentation than there are UXO) the sample size in terms of square metres to be searched could be much smaller. It should also be possible to measure the indications without excavating them. This could lead to an inherently faster sampling process (even perhaps a single surveyor on a motorcycle) which would be much more efficient and effective than the ETS process (and would be much closer to the axiom of "getting 80% of the result from 20% of the effort). Admittedly, the hypothesis is as yet unproven (as indeed are all the other models described above), but it would also have the benefit of including a physical inspection of the candidate task sites. Furthermore, it would not suffer the problems of adverse selection, in that it could be used on sites that are unlikely to have been bombed or fought over (where the hypothesis would be that the site included a small metal fragment population) as well as on a site which was thought likely to have been bombed (where the hypothesis would be that it contained a larger number of metal fragments). It should be comparatively simple to establish quantitative thresholds for both of these cases.

Combination of techniques

A combination of quantitative techniques at both stages of the process would probably be the most attractive. A variant of the 'Oxiana' approach at the desk analysis stage would give a quantitative assessment of the likelihood of hazard, and when combined with an overlay of the nature of the ground (and therefore its possible future use, particularly in terms of agriculture) would give a true estimate of risk as it would combine hazard and potential activity. A simple version of this approach has been used in the scoping exercise in this Report. A fragment sample could then be used in 'low' areas in order to confirm their status and provide physical evidence of some type of ground processing to end users, in order to prevent a 'False Negative' or 'Type II' error. Combination of both techniques in a quantitative manner would also allow the users to combine both sets of probabilities in a 'Bayesian analysis' which uses a mathematical principle known as 'conditional probability'⁵⁷. This would allow a formal statement of probability of an area being contaminated where *both* a desk analysis using a variant of the Oxiana model and fragment survey suggest that no UXO will be found.

⁵⁷ Bayes' Theorem is a theorem of probability theory originally stated by the Reverend Thomas Bayes. It can be seen as a way of understanding how the probability that a theory is true is affected by a new piece of evidence. It has been used to try to clarify the relationship between theory and evidence. See for example <http://www.trinity.edu/cbrown/bayesWeb/index.html>

The statistical modelling techniques integral to both the Oxiana model and the fragment sampling process may sound complicated; indeed there is some work to be done in ensuring that they are statistically valid. However, this can be turned into something which can be considered as an 'open black box' where a normal user can simply use the resulting tools developed in the research process (i.e. just as in a 'closed' black box), but which can be 'opened' for external validation processes before the model is adopted. In other words, a user will not need to know the principles of Bayesian conditional probability: all he will need to know is that if he finds more than an average of x pieces of fragmentation in y metre-square boxes in an area of z hectares then he should consider it contaminated. This could easily be operationalised into a working SOP (in both English and Laotian) that would be both practical and statistically valid.

Annex 6: Traffic Accident Data in Lao PDR 2005-2007

| Year | 2005 | 2006 | 2007 | Total |
|---------------------------|-------------|-------------|-------------|--------------|
| Total Number of Accidents | 4,619 | 4,620 | 5,198 | 14,437 |
| Total Number of Deaths | 414 | 480 | 608 | 1,502 |
| Total Number of Injuries | 7,312 | 7,825 | 8,714 | 23,851 |

Source: Handicap International
Road Safety Project