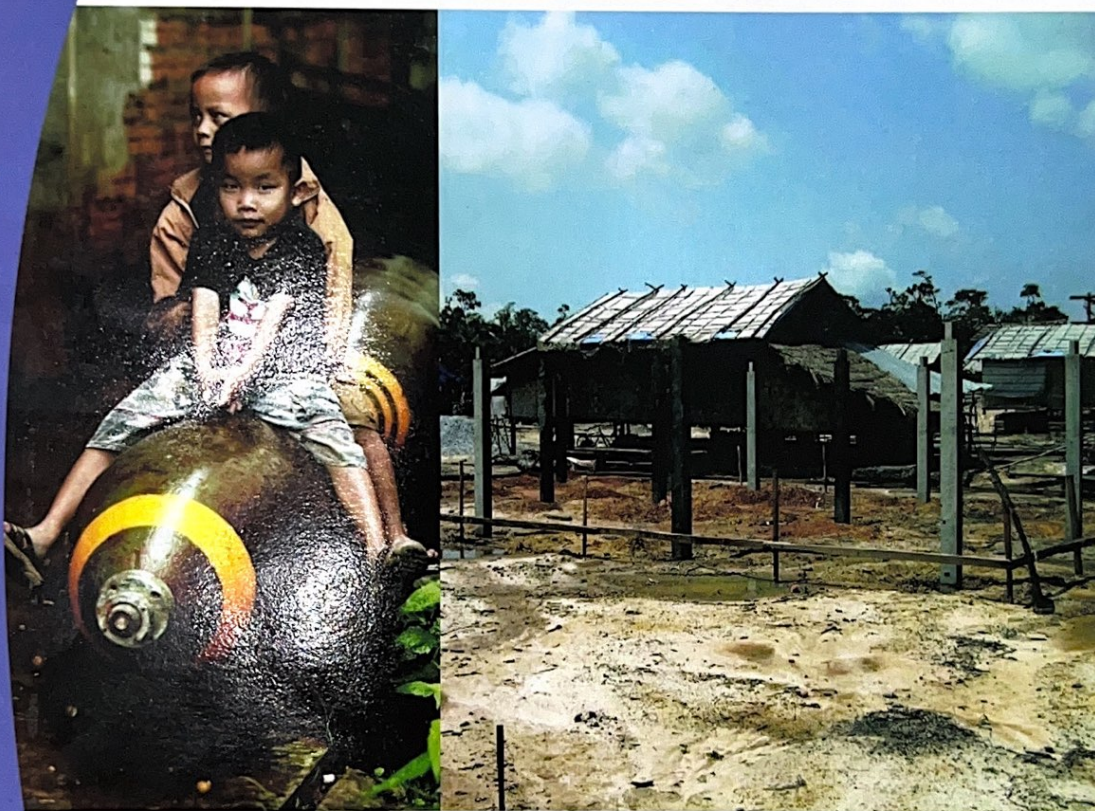


POST UXO CLEARANCE IMPACT ASSESSMENT IN LAO PDR



September 2010

Supported by:



Post Clearance Impact Assessment in Lao PDR

Jo Durham Team Leader

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September 2010

Forward

The extent of UXO contamination in Lao PDR and the impact that it has is large, but how to define 'large' has been a difficult challenge for us. Lao citizens have lived and in many cases died within an environment of UXO and unless we bring in new resources or new methods to our work in countering the impact of UXO, then the sad reality is that they will continue to do so.

UXO poses a risk of injury and is also a constraint to development. It is clearly important that our 'limited' UXO clearance resources are allocated to the highest priority work so that best value or impact can be gained from them. The NRA commissioned this study as one step towards understanding how effective our UXO clearance is and where we should consider making improvements in our planning and prioritization approaches. The study is 'limited' by design to look specifically at the work of our humanitarian clearance operators, in the main that is UXO Lao and our international NGO partners. This study does not examine the 'impact' of commercial clearance, or that of major infrastructure clearance funded through Government of international financial institutions. Nor was the study directly tasked to examine questions of cost efficiency and of cost benefit. These areas of information will form part of the ongoing research and progress monitoring of the NRA.

In reviewing this report I encourage you to look beyond the executive summary, and as an incentive to read paragraph 4.2.6 *Freedom from fear of UXO injury* and for a moment to consider how your own home communities would react under such circumstances. I am sure we would all agree that the situation of living with UXO is not 'right'.

We are committed to take the recommendations from this study forward into our survey work, in our ongoing research and in our future work planning. We acknowledge and appreciate the dedicated work of the PCIA research team, Ms Joanne Durham and Mr Vongnanhthavong and the people and organizations that openly supported their work. The research team, although focused in PCIA, have also contributed in a major way to the establishment of a formal standing research capacity within the NRA and the UXO sector. Finally we are grateful the Governments of Australia and the United States of America for their support and foresight in funding the research.



Director NRA

Vientiane

Phetsavang SOUNNALATH

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Abbreviations

AusAID	Australian Agency for International Development
FSD	Swiss Foundation for Mine Action
GDP	Gross Domestic Product
HIB	Handicap International Belgium
I	Interviewer
IMAS	International Mines Action Standards
LECS	Lao Expenditure and Consumption Survey
MAF	Ministry of Agriculture and Forestry
MAG	Mines Advisory Group
MPI	Ministry of Planning and Investment
NGOs	Non-Government Organizations
NGPES	National Growth and Poverty Eradication Strategy
NPA	Norwegian People's Aid
NRA	National Regulatory Authority for UXO Sector in Lao PDR
ODA	Official Development Assistance
OECD-DAC	Organisation for Economic Co-operation and Development/ Development Assistance Committee
PCA	Post Clearance Assessment
PCIA	Post Clearance Impact Assessment
R	Respondent
SODI	Solidarity Service International
UNDP	United Nations Development Programme
UXO Lao	Lao National Unexploded Ordnance Programme
UXO	Unexploded Ordnance
VAC	Village Assistant Clearance

Executive Summary

In the Lao PDR, humanitarian UXO action and UXO clearance specifically, aims to reduce UXO related injury and death and contribute to the Government of Lao PDR's National Growth and Poverty Eradication Strategy (NGPES) (Government of the Lao People's Democratic Republic, 2004a). One of the underlying theories of UXO action is that UXO clearance releases livelihood assets. The expectation is that program recipients will use these assets productively to accumulate other assets and improve livelihoods.

But is UXO action effective? Is it relevant and meeting the various stakeholders' needs? How does it support broader development initiatives? How do the poor benefit from UXO clearance? How do people use UXO cleared land in order to improve their livelihoods? How are benefits sustained? How does UXO clearance contribute to district and provincial poverty eradication plans? Is UXO clearance contributing to its overall goals of contributing to UXO related injury and poverty eradication?

This assessment was undertaken in three districts in three different provinces in Lao PDR during 2010 (Nong, Savanakheth; Pek, Xieng Khouang; and Paksong in Champassack) and aims to begin to address these questions. The assessment was restricted to clearance undertaken for humanitarian purposes. The overall research question is 'Who benefits from UXO clearance, in what ways and in what contexts?' The specific objectives are:

- Identify impact of humanitarian UXO clearance on household livelihoods
- Develop and test impact assessment tools which can be used for monitoring and assessment of benefits from UXO clearance in future
- Develop 'the program theory' which can be used for monitoring and evaluation
- Develop key recommendations to inform UXO clearance

In line with the OECD-DAC evaluation framework, the assessment also considers questions of context; relevance; effectiveness; efficiency, impact and sustainability (DAC/OECD, 2002).

1. Assessment design

The assessment used a theory-based approach to evaluation (Pawson & Tilley, 1997). The approach is particularly useful when investigating impact and causal linkages in complex social programs where there is no baseline data (Donaldson, 2009). Program theory is similar to program logics commonly used in development aid to show the process from inputs (resources) to outcomes or impacts (long-term results). The approach taken in this assessment also recognizes that outcomes/impacts are a result of both program activities and decisions that program recipients given the other resources available to them and context (Wong, Greenhalgh, & Pawson, 2010). In other words, new resource (e.g. cleared land) + household characteristics + reaction to the new resource + broader contextual factors = outcome and impact.' The livelihoods approach provided the theoretical framework for the assessment (Ashley & Carney, 1999).

1.1. Research method

This is mixed methods study, which used qualitative and quantitative research methods. It was conducted in four phases:

- Phase 1: Establishment of Oversight Committee and stakeholder meeting in Vientiane with operators

- Phase 2: Pilot and data collection in Nong district
- Phase 3: Data collection in Pek and Paksong district
- Phase 4: Stakeholder workshop in Vientiane with district staff from government and operators, followed by provincial level presentations, Oversight Committee and stakeholder meeting in Vientiane

In total 22 qualitative interviews with program recipients were undertaken. A further 11 qualitative interviews were conducted with local government officials and operators. A total of 1,244 questionnaires were administered.

1.2. Limitations

A number of strategies were undertaken to ensure rigour including a large random selected sample, training of enumerators, not being accompanied to the field by the staff of operators, translation and back translation of the questionnaire and livelihood scale, on-site quality assurance and rigorous testing of the livelihood scale. Nevertheless, as with most social research conducted in real life contexts there are a number of limitations. Including:

- Quality of historical data stored in the NRA database;
- Lack of baseline data and on-going monitoring;
- Limitations of quantitative survey instruments in contexts with low educational levels (Samman, 2007).

2. Findings

2.1. Summary of key findings

Summary of key findings

UXO clearance is effective in increasing people's sense of safety and optimism for the future - prerequisites for accessing other development opportunities. The way in which households use cleared land depends on access to assets, values and sense of self-efficacy. Households with access to a range of assets (e.g. finance, equipment, labour, knowledge) and a sense of self-efficacy are able to use cleared land to accumulate other livelihood assets including finance. Household which have limited access to assets will use the land but it will take longer for such families to maximise its benefits. Demographic variables, for example, age, gender, sex of household head, do not seem to have a significant effect on outcomes nevertheless, women are often excluded from pre and post clearance discussions with UXO agencies. The extent to which benefits are sustained over time is dependent on household

context and the broader socio-economic context particularly:

- Institutional policies/ practices
- Market stability
- Environment (e.g. soil quality, flood, drought, pests)
- Stage in livelihood transition
- Access to community assets

The program is effective in reducing exposure to UXO. It contributes indirectly to poverty reduction but impact is constrained by communication and prioritization process. The program is relevant to national priorities but not always clearly linked into district level poverty reduction strategies. Cost efficiency or cost benefit analysis was not part of this assessment. Currently however, clearance assets are often repeatedly deployed to the same villages and it is not possible to state that any villages or districts are 'impact free'.

2.2 Land use

In most cases land was being used post-clearance. Often pre and post clearance land use was similar. Clearance however enabled households to farm land more effectively or for an existing resource, such as school to be upgraded. In Paksong and Pek where land had been cleared for a community resource often people could not remember the clearance taking place. This was due to several reasons including lack of clear communication or the resource not directly being used by the household or respondent. Ineffective communication was a common theme throughout the qualitative interviews and related to the whole process not only post-clearance land use. A similar finding was found in the 2008 Gender Assessment (MAG Lao & UNDP, 2008). The latter is in part due to over-reporting of beneficiaries and/or not clearly separating direct from indirect beneficiaries. For example, where a resource is cleared for several households, such as a weir, there is tendency to report the whole village as benefitting whereas in reality only a few houses have access to or use the new resource.

2.3 Providing access to one resource contributes to accessing other resources

Providing access to one resource (e.g. agricultural land) can help people access other assets. For example, removing UXO from agricultural land, combined with confidence in the quality of clearance, allows people to farm more effectively, which in turn releases labour for other livelihood activities. A road for example gives people more access to information and opportunities to meet people outside of the immediate village environment. The number of assets released through clearance has a positive association with reported impact on the livelihood assessment scales.

In order to use the land more effectively however, people also need the necessary skills and knowledge as well as labour and equipment. They also need to believe that the effort will bring rewards which they value. Continuing evidence of using the land in way which contributes to fulfilling their livelihood goals is also a factor in sustaining post-clearance land use. Focusing on individual households however can also lead to what one operator called a 'scattered approach' with resources being deployed to a village for a short period of time and only undertaking a limited number of tasks. In general in working to reduce poverty it is generally accepted that working with communities rather than individual households is more effective (Epprecht, Minot, Dewina, Messerli, & Heinemann, 2008; Keating & Hertzman, 1999).

2.4 Gender aspects of impact

Men and women may experience different impacts from UXO clearance. For example, a road benefits women in that it is easier for them to get to the market to sell vegetables, a water point saves them time in collecting water. This is similar to the 2008 study finding (MAG Lao & UNDP, 2008).

2.5 Promoting donor/NGO investment

A very common theme was that UXO clearance is a first step in enabling people to access other development opportunities. It is also often essential for donor/NGO investment with some NGOs asking for evidence of clearance prior to commencing their development projects.

2.6 Most significant change

The reported most significant change depends largely on the type of post-clearance land use. Where land is cleared and used for agriculture for example, the most significant reported change was increased sense of safety.

2.7 Barriers to post-clearance land use

Level of household and community assets can contribute to how quickly cleared land is put into use and to what extent benefits are sustainable. Having labour and physical equipment were said to be particularly important. Timing of clearance is also important. For example, if clearance is not completed before planting time households are unable to plant for a season.

Another potential negative impact is the current quota approach (where only a certain number of households or hectares are cleared per village per year), means that only a certain number of households in a village receive clearance in a given year. It was often reported this can result in confusion as it is not always clear to people why one household was selected and not another.

2.8 Demographic variables and impact

In our samples, demographic variables, for example, age, gender, sex of household head, do not seem to have a significant effect on outcomes. A similar finding was found in World Food Programme study (World Food Programme, 2007).

2.9 Accessing UXO clearance services

Looking at who accesses UXO services helps us to answer *who* benefits from UXO clearance. Access to assets such as labour, equipment, seeds and finance affects how and when land is used as well as the type of specific benefits. Access to livelihood assets is also a factor in accessing services.

To build a program theory and look at *who* benefits from UXO clearance, we also need to look at the personal characteristics that may influence post-clearance land use. The three most important personal factors are:

- Awareness and participation (builds sense of ownership)
- Self-efficacy (belief that can do something)
- Task efficacy (belief that the activity is beneficial)

A number of household factors were identified which affect the way in which post-clearance, land is used and assets accumulated. There are also several broader socio-

economic factors, which affect impact, and the extent to which any change is sustained. The main contextual factors are:

- Institutional policies/ practices
- Market stability
- Environment (e.g. soil quality, flood, drought, pests)
- Stage in livelihood transition
- Access to community assets

Changes in any of these contextual factors can either increase or decrease benefits. The extent to which benefits are sustained therefore depends in part on stability of the broader socio-economic environment. A number of institutional policies however can also be identified, including for example, improving communication and support for those with low labour availability to be able to access services.

2.10 Program effectiveness

2.10.1 Contributing to poverty reduction

Often the poorest sections of the community do not receive UXO clearance services for individual plots of land. Further, their generally limited access to assets often limits post-clearance economic benefits. Nevertheless, poorer household reported direct and indirect gains from clearance including social and human assets. Enabling farmers to use more efficient land preparation techniques through UXO clearance can also release labour for other activities. Having safety needs met and seeing evidence of development, people are more likely to invest in human capital, for example, by sending children to school. Contributing to strengthening human and social assets are positive outcomes likely to have a long-term impact on improving financial assets and coping with the livelihood transition (Rigg, 2005).

Factors which the assessment team identified as limiting the sectors contribution to poverty reduction at the household level and which can be improved are poor communication and a complicated request system (from the perspective of a subsistence rice farmer with limited education). A community based approach, where once in a village the operator clears all the land that is contaminated, or at least cluster munition contaminated as these are the most common cause of non-tampering injuries, is likely to make a greater contribution to poverty reduction (Epprecht, et al., 2008; Keating & Hertzman, 1999; Krishna, 2007). Evidence of success in some households is also likely to contribute to willingness to try new opportunities by other households (Cramb, 2003; Rogers, 1983). Working with communities in a participatory way will also increase engagement and sense of ownership. A community rather than individual focus will also contribute to the Convention on Cluster Munitions obligations and help the sector develop exit strategies and indicators at the village and district level.

At the district level, links with poverty reduction efforts were not particularly clear. Further, while most of the tasks are Priority I and Priority II tasks as outlined in the Safe Path Forward, a broader combination of assets are needed in order to facilitate development (World Bank, 2006). Providing access to improved roads, water and sanitation would improve human assets and enable households to diversify their livelihood strategies – an important pathway out of poverty (Krishna, 2007; Rigg, 2005). Focussing on communities and a broader range of tasks will also support the near poor and help control the increasing of poverty- which is often long-term with intergenerational effects (Keating & Hertzman, 1999; Krishna, 2007).

2.10.2 Reducing risk of UXO injury

Often land cleared of UXO is in use prior to clearance despite being contaminated. In the course of their routine work therefore, affected communities are often exposed to UXO. While difficult to quantify in this assessment, in removing UXO from this land, the program is effective in reducing the likelihood of exposure to UXO. Given that exposure can result in injury and that managing the cost of a UXO injury and/or losing a labour unit from the household is potentially a catastrophic event, with intergenerational affects, this is an important outcome (Wagstaff & Lindelow, 2010).

2.11 Relevance

The program is relevant to Government priorities and its ninth Millennium Development Goal¹. The slow process of clearance however, and the process of task selection and identification, make it less relevant to district, community and household needs in terms of contributing to poverty reduction and reducing risk of exposure to UXO as people are compelled to use contaminated land.

2.12 Efficiency

Cost efficiency or cost benefit analysis was not part of this assessment partly due to its limited application within contexts of rural subsistence economies (Harpviken, 2003; Paterson, Paktian, & Fryer, 2008). The quota system however where a limited amount of land area per village is cleared in any one year means that clearance assets are often repeatedly deployed back to the same villages in subsequent years. Further, it is not possible to state that any villages or districts are 'impact free'.

3. Summary of main recommendations

- Strengthen capacity and role of district government in working with communities and other development actors and developing priorities
- Apply community development principles to UXO clearance task selection and prioritisation
- Implement standardised comprehensive monitoring and evaluation systems at household, community and district level including baseline data

The main report includes a detailed description of these recommendation and suggested indicators.

¹ MDG 9: To reduce the Impact of UXO in Laos in accordance with the National Strategic Plan for the UXO Sector. 9A: ensure the complete clearance of UXO from high priority / high value agricultural land by 2020. 9B: Reduce substantially the number of casualties as a result of UXO incidents. 9C: Ensure that medical and rehabilitation needs of all UXO survivors are met in line with treaty obligations under the Convention on Cluster Munitions.

1. Introduction

In the Lao PDR, humanitarian UXO action and UXO clearance specifically, aims to reduce UXO related injury and death and contribute to the Government of Lao PDR's National Growth and Poverty Eradication Strategy (NGPES) (Government of the Lao People's Democratic Republic, 2004a). One of the underlying theories of UXO action is that UXO clearance releases livelihood assets. The expectation is that program recipients will use these assets productively to accumulate other assets and improve livelihoods.

But is UXO action effective? Is it relevant and meeting the various stakeholders' needs? How does it support broader development initiatives? How do the poor benefit from UXO clearance? How do people use UXO cleared land in order to improve their livelihoods? How are benefits sustained? How does UXO clearance contribute to district and provincial poverty eradication plans? Is UXO clearance contributing to its overall goals of contributing to UXO related injury and poverty eradication?

Despite over a decade of donor funded humanitarian UXO clearance in Lao PDR, to date these questions remained largely unanswered. The purpose of this report and the post-clearance impact assessment, undertaken by the National Regulatory Authority for the UXO sector (NRA), is to begin to answer the questions above. The overall intent is to identify opportunities for maximising positive impact on household livelihoods. While humanitarian mine/UXO action survey, clearance, mine risk education, victim assistance and advocacy (United Nations, 2003), this report focuses on "operational demining". Specifically, it considers the process of selecting sites for and then undertaking area clearance and the outcomes this produces for households and communities. A second purpose is to develop a program theory of change (similar to a logic model) identifying key indicators and tools, which can be used for future monitoring and evaluation purposes.

The assessment was undertaken in three districts in three different provinces in Lao PDR during 2010 (Nong, Savanakheth; Pek, Xieng Khouang; and Paksong in Champassack) and was restricted to clearance undertaken for humanitarian purposes. The overall research question is 'Who benefits from UXO clearance, in what ways and in what contexts?' The specific objectives are:

- Identify impact of humanitarian UXO clearance on household livelihoods².
- Develop 'the program theory' which can be used for monitoring and evaluation
- Develop key recommendations to inform UXO clearance

In line with the OECD-DAC evaluation framework, the assessment also considers questions of context; relevance; effectiveness; efficiency, impact and sustainability (DAC/OECD, 2002).

The report is divided into the following sections: Section 1: Literature Review; Section 2: Methods; Section 3: Findings; Section 4 Discussion and Comments and Section 5 Recommendations.

² Develop and test impact assessment tools which can be used for monitoring and assessment of benefits from UXO clearance in future

2. Literature review

2.1. Lao PDR: An overview

Despite an estimated economic growth of 7.5 and significant poverty reduction, Lao PDR is one of the poorer countries in Asia (The World Bank, 2009). It has a GDP per capita of 5.5 but 33 per cent of population continue to live below the national poverty line (The World Bank, 2009). There are substantial urban-rural divides and geographic variations in poverty and development with most of the poor living in rural areas. The incidence of poverty is particularly high in remote areas, the uplands and among minority groups (Wagstaff & Lindelow, 2010). The poverty rate is highest in the sparsely populated central, eastern and southern districts along the Vietnamese border – areas also heavily UXO contaminated.

Over 70 per cent of the population have limited road, market, safe water and sanitation access. Lack of insurance or safety nets makes the very poor, poor and near poor particularly vulnerable to livelihood shocks (e.g. drought, insect infestations, floods, market fluctuations, illness, injury and deaths of household members). To address this, efforts to tackle poverty must build household and community livelihood assets, increasing their ability to manage livelihood shocks (Scoones, 2009). As the rural economy transitions to a market economy, households will need a range of livelihood assets, including human capital (e.g. training, skills, and knowledge) to take advantage of market economy opportunities (Rigg, 2007).

The Government uses a consumption based definition of poverty based on the ability to provide 2,100 Kcal per person per day or where the income is less than kip 192,000 per person per month (24 USD at February 2011 exchange rate, 1USD = 8040 kip). Poor villages are those where at least 51% of households are poor and lack access to schools, dispensaries, traditional healers, safe water, roads or trails, and are over 2 hours away from a hospital ("Prime Minister Decree on Poverty Line and Development Standard 2010-2015," 2010). Based on this data the Government has identified 72 poor districts of which 46 are considered priority³.

Rural development is central to the country's poverty eradication efforts. This includes improving access to development infrastructure and strengthening district capacities to plan, implement and coordinate poverty reduction activities (Government of the Lao People's Democratic Republic, 2004a, 2006).

2.2. UXO contamination in the Lao PDR and its effect on development

Per capita, Lao PDR is the most heavily UXO contaminated country in the world with 15 of the 18 provinces⁴ UXO contaminated (Handicap International, 1997). Of these provinces, nine are considered heavily affected and have UXO humanitarian operations in process. UXO operations commenced in a tenth Province, Borikhamxay in 2009. UXO clearance is seen as an essential precursor to facilitating development and a key cross cutting issue (Government of the Lao People's Democratic Republic, 2004a, 2006). Lao PDR is a signatory to the Convention on Cluster Munitions with the Convention ratified on 18th March 2009 (Landmine and Cluster Munition Monitor, 2010).

The extent of the contamination and the precise area cleared to date is unknown and based on estimates (Landmine and Cluster Munition Monitor, 2010). A 2002 evaluation estimated that 236.8km² of potential agricultural land remained UXO contaminated (Nippon Koei Co. Ltd. and KRI International Corporation, 2002). A more recent evaluation, based on

³ Initially 47 districts were identified but this has been revised down to 46; Borikhan district of Borikhamxay province has been lifted to next level

⁴ At the time of survey there were 18 provinces

assumed productivity and costs, estimated that there is 22,000 hectares within the 46 poorest Districts of contaminated or unused land whose productive value would result in an economic return on investment if developed for agricultural purposes (Griffin, Keeley, & Sayyasouk, 2008). The evaluation calculated productive value using the market value of the crops (including cattle and goats) that the land could produce with (Griffin, et al., 2008). In Lao PDR however, the presence of UXO does not prevent livestock production (World Bank, 2006).

A World Bank study linked district level UXO impact data using the Handicap International survey, LECS II–III and qualitative data collected from six affected communities in Kaleum district. The study found that where more than 50 percent of villages are affected by UXOs, there is an association with lower than average access to potable water and sanitation, more household time spent on fuel wood and water collection, and with lower education levels and health status. Villages in highly contaminated areas were also less likely to have development projects with some also experiencing a higher rate of out-migration. The study concludes UXO decontamination can be a win-win solution in terms of poverty reduction if properly directed. The report further concludes that effort should focus on facilitating infrastructure development, especially village network roads, access to safe water and sanitation (World Bank, 2006). The report also suggests a review of the sector's ability to provide UXO support to resettled groups (World Bank, 2006).

A nationwide survey recorded 50,136 UXO-related casualties since 1964 to 2008 (National Survey of UXO Victims and Accidents Phase I, 2010). Most were injured during and in the immediate post conflict period with a steady decline after that, stabilising at about 300 per annum since 1992⁵. Injuries from routine farm activities appear to have declined, possibly due to a combination of clearance, local risk reduction strategies and livelihood diversifications. While not singling out UXO related injury, a World Bank report found that health shocks in Lao PDR have a severe impact on the poor and are generally more costly than other common livelihood shocks (e.g. floods, drought, pests) (Wagstaff & Lindelow, 2010).

A 2008 gender study found post-clearance impacts are likely to have a gender dynamic. Access to safe water, for example, can significantly reduce the time female adults and children spend on both water collection and boiling water for safe consumption. Following road and bridge construction men reported increased opportunities in off farm labouring. Women reported deriving income from improved access to the market. This income is then used to purchase basic household items (Durham, 2008).

2.3. Humanitarian UXO clearance program in Lao PDR

The humanitarian UXO clearance program in Lao PDR has been operational since 1994, although UXO clearance in the nine provinces where there are currently humanitarian mine action operations did not start until the period 1996 - 1999 with the establishment of UXO Lao. International donors are the main source of sector funding, with UXO Lao, the national program, being the largest provider working in the nine most affected provinces. The other providers in the humanitarian sector are Mines Advisory Group (MAG), Solidarity Service International (SODI), Handicap International Belgium (HIB), Norwegian People's Aid (NPA) and Swiss Foundation for Mine Action (FSD). Since 2006, the sector has been overseen by the National Regulatory Authority, under the Prime Minister's Office. The NRA provides policy direction, manages and coordinates with organizations licensed to be UXO/Mine Action operators in Lao PDR. The NRA is also responsible for developing

⁵ Based on absolute numbers rather than incidence and prevalence rates as a proportion of the population

national standards, monitoring of all UXO/Mine Action activities in the country, including monitoring of quality, post-clearance land use and longer-term impacts.

The 'Safe Path Forward' (Government of the Lao People's Democratic Republic, 2004b) provides strategic direction for the sector. Under this strategy, there are three priority areas:

Type of task	
Priorities	
Priority I (High)	Agricultural tasks Roving tasks Public service utilities (medical/public health, water points, etc.) Educational facilities
Priority II (Medium)	Grazing land and forested areas Communal facilities (religious/cultural sites, markets, recreational areas, etc) Government facilities and offices
Priority III (Low)	Public infrastructure work Communal "profit-making" areas Tourism sites Commercial/private business sites

Humanitarian providers usually focus on priority areas I and II. Priority III areas are usually funded through the World Bank, the Asian Development Bank or private investors. While the humanitarian operators all identify and prioritise sites for clearance slightly differently with different mechanisms of communication and community participation, generally some form of a village quota system is used whereby a certain area is cleared for individual households or small scale community infrastructure projects. To date, no villages or districts can be declared 'impact free' of UXO.

3. Assessment design

The assessment used a theory-based approach to evaluation (Pawson & Tilley, 1997). The approach is particularly useful when investigating impact and casual linkages in complex social programs where there is no baseline data (Donaldson, 2009). Program theory is similar to program logics commonly used in development aid to show the process from inputs (resources) to outcomes or impacts (long-term results). The approach taken in this assessment also recognizes that outcomes/impacts are a result of both program activities and decisions that program recipients given the other resources available to them and context (Wong, et al., 2010). In other words, new resource (e.g. cleared land) + household characteristics + reaction to the new resource + broader contextual factors = outcome and impact.

3.1. Livelihoods approaches

The livelihoods approach provided the theoretical framework for the assessment (Ashley & Carney, 1999). This was selected as it provides a holistic approach to poverty and

livelihoods. Further, economic development does not happen in a linear fashion and there is evidence to suggest that investments are needed in human and physical capitals in order for participation in monetary economy (Greig, Hulme, & Turner, 2007). The approach is based on five classes of livelihood assets: human, physical, social, finance and environment.

Asset	Operational definition
Human	Quality of human labour available e.g. health, food security and diversity, ability to access education/send children to school regularly, time available to spend on income generating activities, feeling positive, knowledge and skills, sufficient food, sense of safety
Social	Social networks, fulfil social and cultural obligations and gather information
Financial	Ability to purchase basic goods and services for household members, savings and investment, access to credit
Physical	Access to basic infrastructure e.g. schools, clinic, access road, market, potable water
Environmental	Access to forest, farm land and water sources

These assets are dynamic in nature and can be affected by the vulnerability context, that is, trends, shocks (for example armed conflict and natural disasters) and seasonality as well as the broader political and socio-economic context. The extent to which households are able to use these assets to secure livelihoods is influenced by the external political, institutional, and legal environment (Collinson, 2003; Scoones, 2009).

UXO contamination can be seen as blocking access to livelihood assets. For example removing farmland from use and obstructing the rehabilitation or building of local infrastructure. UXO clearance provides access to livelihood assets. Given UXO also threatens the safety of people, the questionnaire also included questions about people's sense of safety.

3.2. Research method

This is mixed methods study, which used qualitative and quantitative research methods. It was conducted in four phases:

- Phase 1: Establishment of Oversight Committee and stakeholder meeting in Vientiane with operators
- Phase 2: Pilot and data collection in Nong district
- Phase 3: Data collection in Pek and Paksong district
- Phase 4: Stakeholder workshop in Vientiane with district staff from government and operators, followed by provincial level presentations, Oversight Committee and stakeholder meeting in Vientiane

3.3. Sampling

3.3.1. Phase 1

An Oversight Committee provided feedback and advice on assessment design, findings and recommendations. The Committee consisted of NRA officers, UXO Lao, HIB, Oxfam Australia, UNDP, MAF, MPI, AusAID. In addition, all humanitarian UXO clearance operators attended a stakeholder meeting (26th Nov 2009) to draft an initial program theory. This helped guide the research questions. In this phase, the NRA Research Technician and Operations Officer met with each of the relevant provincial and district authorities to explain and get support for the assessment.

3.3.2. Phases 2 and 3:

a. *Qualitative*

Using the NRA database and in discussion with key informants program recipients were purposively selected based on who it was felt would be able to provide insight into the topics being researched. In total 22 in-depth household interviews were conducted. In addition, in each district relevant officials were interviewed with one group interview in Nong and a total 11 in-depth interviews in the other two districts. Respondents in each district included for example, the District Governor, District Agriculture and Forestry Office, District Labour and Social Welfare Office, Education Office, Public Work and Transportation Office, Planning and Cooperation Office and UXO Operators. Interviews were conducted in the respondents' preferred language.

b. *Quantitative*

Using the NRA database and probably proportional to size, 30 clusters were selected in each district (Toole, 2004). An equal number of program recipients were randomly selected from each of the clusters based on whether they had received clearance for individual use, individual and community use or community use only. In total the sample size was 1244 (Nong n=214, Paksong n=360, and Pek n=670). The difference in sample size is based on the number of household program recipients between 2005 and 2009 (estimated from the NRA database).

3.4. Demographic profile of sample

3.4.1. Nong District

Most respondents reported that their main source of income was rice farming. Ninety-seven per cent (n=207 out of 214) of households were male headed with the average age of the household head being 39. The average number of labour units per household was reported as three. Thirty-nine per cent (n=84) of adults within the household reported having no education and only 14 percent had studied above primary school. Most of the respondents characterized themselves as being Mon-Khmer (95% n=203).

Ninety per cent (n=193) of respondents reported that no one in their household had suffered a UXO related injury, 10 per cent (n=821) reported one or two people suffering a UXO related injury. Nine per cent of households (n=20) reported having someone in their household who was unable to work due to chronic illness or disability.

3.4.2. Paksong district

The total number of people interviewed was N=359, 88 respondents were excluded from the analysis as they reported not being aware of any clearance activity in their village. The final number of people included in the analysis was n=271 (Male n=147 (54 per cent),

female n=124 (46 per cent)). Sixty-one percent of respondents reported being Lao-Tai with the remainder Mon-Khmer.

Ninety-four per cent (n=249) of respondents reported that their main source of income was from cash crops, mainly coffee. Ninety-three per cent (n=253) of households were male headed with the average number of labour units per household three. In 91 per cent (n=247) of households, at least one adult had completed education above primary school. Ninety-six per cent (n=259) of respondents reported that no one in their household had suffered a UXO related injury, 3 per cent (n=8) reported two people suffering a UXO related injury and one per cent (n=4) reported having two or more household members who had received a UXO related injury. Seven per cent of households (n=18) reported having someone in their household who was unable to work due to chronic illness or disability.

3.4.3. Pek District

The total number of people interviewed was N=668, 159 respondents were excluded from the analysis as they reported not being aware of any clearance activity in their village. The final number of people included in the analysis was n=509 (Male n=293 (58 percent), female n=216 (42 percent)). Eighty per cent of respondents characterized themselves as Lao-Tai, three per cent as Mon-Khmer and 17 percent as Hmong-Miet. The main household income source was from lowland rice farming.

Ninety-five per cent (n=485) of households were male headed with the average number of labour units per household 3. In 95 per cent (n=482) of households, at least one adult had completed education above primary school. Eighty-six per cent (n=446) of respondents reported that no one in their household had suffered a UXO related injury, 12 per cent (n=60) reported two people suffering a UXO related injury and two per cent (n=9) reported having two or more household members who had received a UXO related injury. Ten per cent of households (n=52) reported having someone in their household who was unable to work due to chronic illness or disability.

Table 1. Respondent and Household Characteristics as a Percentage of the Sample by District

Characteristic	Nong (n = 214)	Paksong (n = 271)	Pek (n = 509)
Sex			
Male	62	54	58
Female	38	46	42
Linguistic group			
Lao-Tai	5	61	80
Mon-Khmer	95	39	3
Hmong	0	0	7
Sex of household head			

Male	98	95	93
....Female	2	5	7
Wealth index score*			
Poorest	42	43	36
Middle	30	32	46
Least poor	28	25	18
Highest level of education (in household)			
No school	39	1	0.4
Some primary	32	3	1
Completed primary	15	5	4
Above primary	14	91	95
Main source of household income			
Cash crop	0	92	0
Rice (lowland)	3	0	50
Rice (upland)	35	0	4
Sell livestock	33	0.5	13
Wage labour	10	2	14
Other	19	5.5	19
Average number of household work units	3	3	3

*Relative poverty and based on household indicators

Area cleared of UXO between 2005-2009 in square metres was Pek - 7,150,503, Nong - 1,311,597, and Paksong 5,752,843. It was not possible to calculate the exact number of beneficiary households due to inconsistencies in recording in the database.

3.4.4. Phase 4:

District authorities and operators were invited to a workshop in Vientiane to validate findings and provide recommendations; there were 22 participants from districts, provinces and central level (see annex 1). Following this, the NRA gave presentations in each of the provinces to provincial government and operators. Findings and recommendations were then

presented to the Oversight Committee before a final presentation was given to stakeholders in Vientiane.

3.5. Data Collection

3.5.1. Phase 1

The research team facilitated a group interview of operators held in the NRA in Vientiane and recorded using a logical framework. The resulting document was circulated for feedback to participants and used to guide question development.

3.5.2. Phases 2 and 3

a. Qualitative

In-depth interviews were conducted in respondents' preferred language using a questionnaire guide and a trained interviewer. Questions included in the guide included how the respondent had accessed UXO clearance services, pre and post-clearance land use and post-clearance outcomes.

b. Quantitative

A structured questionnaire and livelihood asset scale⁶ was administered to respondents in Nong. Following this, the questionnaire and livelihood asset scale was revised slightly and administered to respondents in Pek and Paksong. The questionnaire includes standard demographic data and wealth indicators and questions about pre and post land use. The livelihood scale consists of 5 scales based on the livelihood assets. Due to the lack of baseline data, the scale asks respondents to self-rate change on a number of indicators on each scale using a four-point scale.

A four-point, force-choice⁷ scale has been found to work best in settings of low educational attainment (Alexander, Moglia, & Miller, 2010). For each item, a choice of 'not applicable' was also provided. It has been tested rigorously for reliability and consistency in different linguistic-ethnic groups⁸. The scale achieved acceptable levels of reliability but in Pek and Nong district where the respondents had lower levels of literacy and/or translators used the scale performed less well than in Paksong, with participants having difficulty differentiating between each category on the scale.

To minimise the potential for bias, the team worked through local district authorities in arranging data collection rather than UXO operators. For the same reason, UXO operators did not accompany the team to the field.

3.5.3. Phase 4

Participants were purposively selected based on people the team had worked with in the district and who were thought to have a good understanding of UXO issues and poverty within the district.

⁶ The scale was developed in a previous study supported by MAG in Khammouane Durham, J., Xayavong, X., & Inthaxay, B. (2010). The process and lessons learned in developing a questionnaire to assess the impact of clearance on household livelihoods in the Lao PDR. *Journal of ERW and Mine Action* 14(1).

⁷ Forced choice scale Averages that respondents are not given the choice of 'neutral/no change'. For each item however there was the choice of not applicable.

⁸ Based on item response theory using Rasch Analysis and RUMM2030 software.

3.6. Data analysis

3.6.1. Qualitative

The research team analysed the qualitative data using content analysis specifically looking for impacts of UXO clearance, household characteristics and contextual factors using the five classes of livelihood assets as a guide. In addition, after reading each transcript, the team summarised the data in the form of a program logic diagram.

3.6.2. Quantitative

After checking and cleaning the data, the team analysed the quantitative data using SPSS version 16. Descriptive statistics and parametric tests were used to check associations after checking underlying assumptions were not violated (Pallant, 2007). Respondents who had answered 'not applicable' to 50 per cent or more of items on a scale were excluded from the analysis of that scale. The environment scale was excluded from the analysis, as there were insufficient relevant items for this to be considered a scale and insufficient variation in responses. Some changes were made to the scale after the pilot in Nong and therefore the scale in Nong is slightly different to that used in Paksong and Pek.

3.7. Translation

3.7.1. Qualitative

All qualitative interviews conducted in Lao, transcribed into Lao and then translated into English.

3.7.2. Quantitative

The quantitative questionnaire was drafted in English, translated into Lao and then back translated into English. The translation paid attention to using words appropriate for use at the village level. Local translators were provided where Lao was not the first language.

3.8. Training of enumerators

The research team provided training to the enumerators in Vientiane and in the field.

3.9. Quality assurance

Each team consisted of team members and a supervisor who checked all completed documents and undertook quality assurance checks. In addition, the NRA research team accompanied the teams in each field location. Quantitative data was double entered with a random check on five per cent of questionnaires from each district.

3.10. Ethics

Coding was used to protect anonymity and confidentiality of participants. The enumerators and interviewers gave participants information regarding the study and data collection and obtained informed consent. The right to withdraw at any time without retribution was emphasized.

3.11. Cross-cutting issues

The assessment took a participatory approach with guidance from "Standards for Evaluation in the United Nations System" and IMAS 14:10 "Guide for the Evaluation of Mine Action Interventions". All data and statistics were disaggregated by age and sex, and combined with qualitative information on the situation of women and men in target populations.

3.12. The assessment team

The assessment team consisted of an international researcher experienced in evaluation and community based research, and a NRA Co-researcher experienced in community based research. The team were responsible for the overall design and analysis of the assessment findings. The NRA contracted data collection and data entry to local research organisations.

3.13. Limitations

A number of strategies were undertaken to ensure rigour including a large random selected sample, training of enumerators, not being accompanied to the field by the staff of clearance operators, translation and back translation of the questionnaire and livelihood scale, on-site quality assurance and rigorous testing of the livelihood scale. Nevertheless, as with most social research conducted in real life contexts there are a number of limitations. One limitation was the quality of historical data stored in the NRA database. This meant that in some cases the number of program recipients from one site were estimated based on average household size in the district. Additionally, in some cases randomly selected recipients of community-based tasks could not always remember clearance taking place. These people were therefore excluded from the final analysis. Nevertheless, the sample size is still large enough to be sufficiently representative.

Another limitation is the lack of baseline data and on-going monitoring. This makes attributing change because of UXO clearance problematic. The theory-based approach taken in this assessment and the use of mixed methods, goes some way to managing this. Nevertheless, responses are based on people's perceptions of change. Reassuringly however, a number of people were able to identify when changes were not due to clearance and in some cases were very frank with the research team.

A final limitation is the nature of the quantitative tool itself and its applicability in the context of largely poorly educated subsistence farmers. With the exception of Paksong, where respondents were generally more educated, it was generally difficult for respondents to distinguish between the two levels of negative change and the two levels of positive change on the scale. This is a common problem in such contexts and four scales of change, as used in this research, with a not applicable category, are recommended (Samman, 2007).

4. Findings

4.1. Land use

An earlier study in Khammouane (Durham, et al., 2010) had suggested that the level of reported impact on livelihoods and type of impact was associated with both the type of post-clearance land use and whether land had been cleared for individual household, community or a combination of purposes. Based on this and a review of the database, the assessment divided respondents into three groups:

- 1) People who had had land cleared for individual household use only;
- 2) People who had had land cleared for individual household use and a community asset or assets, for example, a school had also been cleared in their village; and
- 3) People who had not had land cleared for individual household use but only for a community asset or assets.

The breakdown of these different groups was as shown below. As the table also illustrates some people were not aware of clearance activities in their village. The main reason that

people in Pek and Paksong reported not being aware of the clearance activities in their village was either they had not participated in the process or, for women, often it was their husband who had been involved and the women were not sure of the details. Further, in Pek and Paksong, people may temporarily migrate out of their village for work elsewhere, in Nong on the other hand, people reported it was unusual for people to go outside of the village or its immediate surrounds. In addition, the process in which community sites are selected often seems to be driven by local authorities, for example through the UXO Lao request process, with limited community participation. It is also due in part to lack of clear communication or the resource not directly being used by the household or respondent. Ineffective communication was a common theme throughout the qualitative interviews and related to the whole process not only post-clearance land use. A similar finding was found in the 2008 Gender Assessment (MAG Lao & UNDP, 2008). The latter is in part due to over-reporting of beneficiaries and/or not clearly separating direct from indirect beneficiaries. For example, where a resource is cleared for several households, such as a weir, there is tendency to report the whole village as benefitting whereas in reality only a few houses have access to or use the new resource.

It is also interesting to note that in Nong and Pek where there is limited access to markets, most of the clearance was for community plots. In Paksong on the other hand, there is an established market for coffee and other cash crops. Importantly there is also access to the wider regional market, so the demand for UXO clearance for individual plots is much higher.

Table 2. *Category of Clearance Reported by Respondents as a Percentage of the Sample by District*

Clearance category	Nong (n = 214)	Paksong (n = 359)	Pek (n = 668)
....Individual household only	2	36	13
Community land only	80	17	54
Individual household and community land	18	22	9
....Unable to recall	0	25	24

The average number of years since clearance for all task categories in Pek and Paksong was three years. In Nong the average number of years since clearance for community land only was two and for community and individual land three years. The average area cleared for individual household use was 1 hectare in Nong and Pek Districts and 1.5 in Paksong District. The qualitative and quantitative data show that often land was in use prior to clearance and often the reason for requesting clearance was that there was visual evidence of UXO contamination. Pre and post land use are often the same although clearance often allows farmland to be used more effectively or for infrastructures to be upgraded. Post-clearance land use may change depending on changes to household circumstances, changes in broader environment or due to timing of clearance, which may result in a delay to land being put back to productive use. The table below shows pre and post land use.

Table 3. *Land use in pre and post clearance in case individual land*

Land types	use	Nong		Paksong		Pek	
		Pre clearance	Post clearance	Pre clearance	Post clearance	Pre clearance	Post clearance
Upland Farming		11	6	26	4	3	5
Lowland Farming		18	24	0	0	96	100
House		6	6	7	13	5	15
Vegetable		2	5	8	5	17	27
Fishpond		2	1	0	2	2	5
Irrigation		1	3	0	0	1	1
Cash Crop		0	1	89	205	4	9
Plantation		0	2	3	3	16	13
Grass Land		0	0	5	0	15	6
Not Use		8	0	107	0	23	0
Others		1	1	8	21	10	11

As the table shows, in Nong and Pek most of the UXO clearance is for lowland farming, this is partly due to strong government promotion of lowland farming as an alternative to upland farming. In Paksong, most clearance for individual plots is for cash crop due to good the established economic market as discussed above.

Table 4. Land use in Pre and Post-clearance in case community land

Land use types	Nong		Paksong		Pek	
	Pre clearance	Post clearance	Pre clearance	Post clearance	Pre clearance	Post clearance
School	97	169	76	117	151	305
Irrigation	35	86	0	0	0	0
Upland Farming	23	5	5	0	2	1
Dry Road Access	23	21	0	0	27	5
Whole Year Road Access	13	18	0	0	19	59
Souksala	3	2	2	3	1	1
House	2	7	0	0	19	0
Wet & Dry Season Lowland Farming	1	1	0	0	0	0
Wet Lowland Farming	0	1	0	0	3	0
Dry Lowland Farming	0	0	0	0	1	0
Government Building	0	1	0	0	0	0
Clean Water	0	28	0	0	0	0
Fishpond	0	12	0	0	2	4
Temple	0	0	30	48	14	31
Grass Land	0	0	3	0	58	24
Cash Crop	0	0	1	3	6	0
Vegetable	0	0	0	0	3	4
Not Use	41	17	48	3	149	16

Others	135	5	23	14	23	28
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As shown in two tables above, most land cleared is for agriculture, school, clean water and suksala (health clinic). These are also priority areas in Safe Path Forward 2003-2013 (Government of the Lao People's Democratic Republic, 2004b). While clearance for infrastructure e.g. road and tourism (third priority) is quite small, many respondents requested more clearance for this purpose. In terms of economic impact, based on this assessment, a combination of clearing agricultural areas and third priority areas is also more likely to result in cash income benefits with access to markets crucial.

4.2. In what ways do people benefit: outcomes and impacts

4.2.1. Changes to Household livelihood assets

Qualitative and quantitative data support the hypothesis that UXO clearance contributes directly or indirectly through additional investment, to improving livelihood assets. How and in what ways is influenced by household characteristics and their access to livelihood assets, self-beliefs and expectations about a positive outcome and the broader socio-economic context. The table below provides examples of reported benefits on household livelihood assets. Impact on sense of safety and reduced worry for children or becoming disabled was one of the most reported benefits followed by benefits to other livelihood assets.

Table 5. Reported benefits on household livelihood assets after UXO clearance

Asset	Key terms	Characteristic response
Human	Dig faster	After clearance it is possible to dig faster and deeper – more effective and more time for other activities
	Time other activities	Using cleared land for paddy gives more time for other activities
	Dare to hire labour	After clearance there is less worry about hiring labour to work on the land (if there was an accident the land-owner would need to pay/no insurance)
		It is easier to send children to school
		There has been less illness
	Easier to go to school	Feel safer when working in the fields, worry less about children
	Less illness	
	Sense of safety/reduced worry	Worry about accidents and loss of limbs – unable to work and cover cost of health care
	Fear of disability/cost of disability (human and finance)	
Social	Food to share	More food means it is possible to share with

	Meeting more people	others (and participate on social activities/ceremonies) Increased number of outsiders coming into the village (more information/trade) Easier to go to the market/district and meet people from outside of the village Received more information
Financial	Sell goods	Sell goods to people coming to village/in the market
	More trade	More trucks and trade come into the village
	Increased production	Production after clearance has increased (more effective farming – dig deeper, makes crop better able to withstand wind/rain)
	Increased land value	Increased production due to increased area under cultivation Land value is higher without UXO
Physical	Road, convenient, trade	Upgraded village road access – more convenient Road brings trade into the village
	School, convenient	New/upgraded school
	Clean water, save time, convenient	With clean water in the village we save time collecting water (time for other activities)
Environment	See less UXO while farming	Before clearance people regularly come into contact with UXO in their land
	Water for washing/fishing	Water from dams (built after clearance) is used for fish breeding (also source of income) and washing

The quantitative data shows that overall there is little reported difference between the mean (average) score between each of the livelihood assets. For all districts, if a rounded figure is provided, the average score is 3 out of 4. In other words, on each of the livelihood asset scales, in each of the districts, on average respondents have reported a positive change. As mentioned under limitations, a limitation of the livelihood scales, and scales in general in the absence of baseline data and in a context such as rural Lao, it is difficult measure exact differences. The qualitative data, however, suggests that the poorest are likely to perceive more improvements in social, human and physical assets before finance assets.

4.2.2. Providing access to one resource contributes to accessing other resources

Providing access to one resource (e.g. agricultural land) can help people access other assets. For example, removing UXO from agricultural land, combined with confidence in the quality of clearance, allows people to farm more effectively, which in turn releases labour for other livelihood activities. A road for example gives people more access to information and

opportunities to meet people outside of the immediate village environment. In this assessment, however, it was not possible to statistically test the association between different types of land use and different impacts on livelihood assets due to the small number of respondents in each category of land use (for example, road, school, water, dam, fishponds, irrigation and so forth). Nevertheless, the number of assets released through clearance does seem to have a positive association with reported impact on the livelihood assessment scales. Further statistical tests (Pearson Product-Moment Correlations) showed a significant relationship with medium effect size between the physical, finance and social scales.

In order to use the land more effectively however, people also need the necessary skills and knowledge as well as labour and equipment. As one respondent succinctly explained, to maximise benefits this could lead to a prioritisation of the not poor over the poor.

'... poor households lack productive land. The good quality land belongs to the not poor; so the concept of clearance focusing on the poor, and effective land use, can be contradictory because the poor lack labour, capital and equipment. A focus on effective post-clearance land use leads to a focus on people who have the potential to use the land the most effectively (the not poor).' (ID_0_3)

Focusing on households can also lead to what one operator called a 'scattered approach' with resources being deployed to a village for a short period of time and only undertaking a limited number of tasks.

4.2.3. Gender aspects of impact

While it was not possible to statistically test associations and the reported impact on the livelihood scales was similar, there does seem to be different types of impact for men and women depending on post-clearance land use. For example, a road benefits women in that it is easier for them to get to the market to sell vegetables, a water point saves them time in collecting water. In Nong women reported more safety than men after clearance because generally women female were more scared of UXO than men. Further, men often feel they can deal with UXO by removing it. Furthermore, normally women spend more time working in the farm than men.

4.2.4. Promoting donor/NGO investment

A very common theme was that UXO clearance is a first step in enabling people to access other development opportunities. It is also often essential for donor/NGO investment with some NGOs asking for evidence of clearance. As one person explained, 'UXO clearance is vital for development projects because if there is no clearance they won't provide funds (for the development project)' (ID_0_2)

Another way in which community assets are cleared is via a request by local authorities. Generally, this is activated by UXO Lao, the national UXO clearance program, sending a letter to local government authorities prior to work planning, asking for their clearance priorities. Local authorities then submit a list of assets, usually schools, temples, clinics or government buildings to UXO Lao. The guidance that local authorities are given in this process is unclear and community participation appears to be very limited. Almost all local government respondents however, said that their understanding was that UXO clearance was primarily for safety rather than economic development and this understanding guided their decision making.

While UXO facilitates and is often a prerequisite for development infrastructure, it can also lead to a somewhat scattered approach. Many times for example, there were cases where resources were deployed in support of a small-scale project, such as a village dam, but no other tasks had been undertaken in the village. From a local government perspective, UXO clearance also contributes to developing further trust between the government and local communities.

4.2.5. Most significant change

The first pie chart below shows the reported most significant change when clearance enables an access road to be built. The second shows the most significant change when clearance is for agricultural land as reported by respondents.

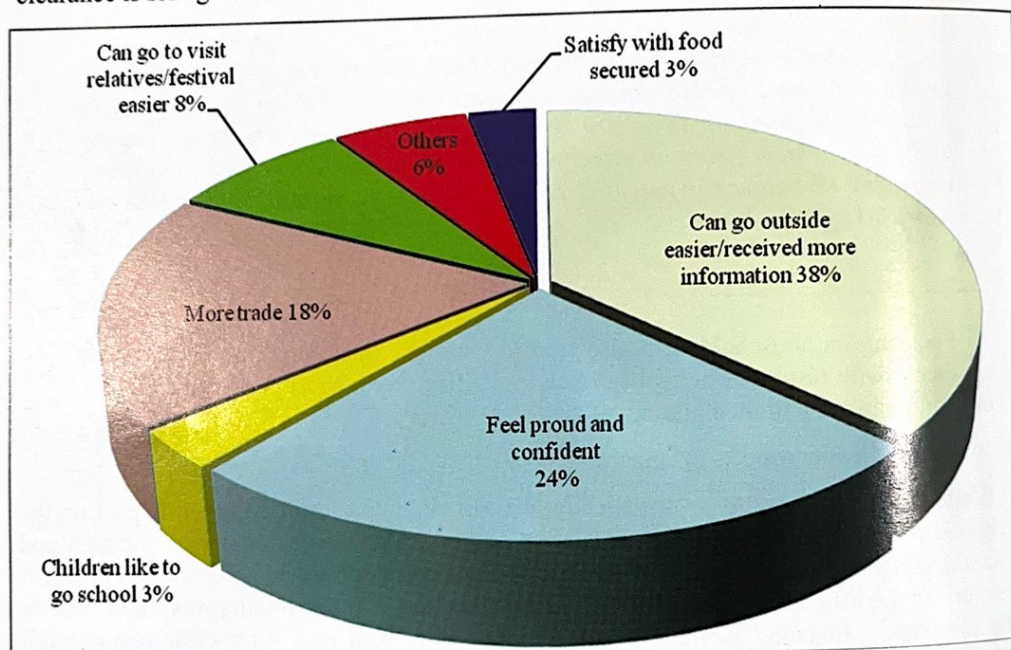


Figure 1. *Most significant change due to land cleared and access road built.*

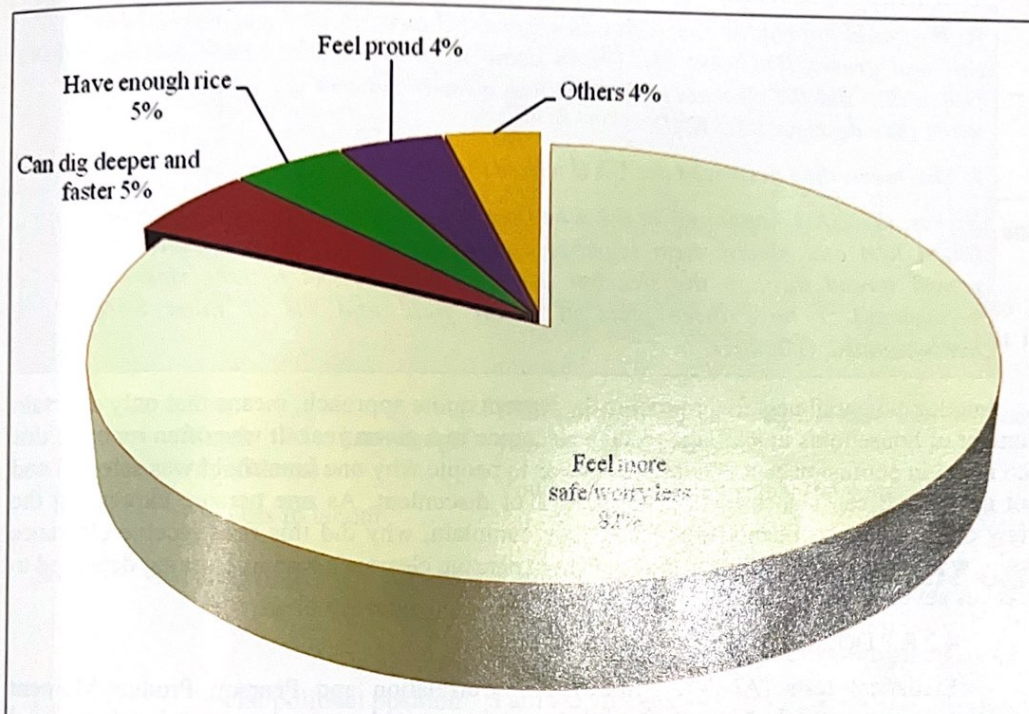


Figure 2. *Most significant change due to land cleared for individual.*

4.2.6. Freedom from fear of UXO injury

A recurring theme in all the interviews and in the quantitative data is that for households, the biggest benefit of UXO clearance is freedom from fear from a UXO injury. Almost all respondents reported using contaminated land due to livelihood priorities. Most people said they could not wait for clearance. Most people said they had strategies to manage UXO contamination but most of these involved some form of handling UXO which people knew could result injury. Respondents frequently expressed the fear of injury being more than the fear of dying due to the burden it would place on the household especially in terms of loss of labour in caring for an injured person and financial costs. Concern for children and generations to come were also a major concern and a reason for wanting UXO clearance.

4.2.7. Barriers to post-clearance land use

The level of household and community assets can contribute to how quickly cleared land is put into use and to what extent benefits are sustainable. Having labour and physical equipment were said to be particularly important. Access to water is also important if the land and some people reported not being able to extend land due to lack of water. In some cases, a community-based project such as a small dam may not be sustained due to the quality of materials or lack of assets for on-going maintenance.

Timing of clearance is also important. For example, if clearance is not completed before planting households are unable to plant for a season. The quote below illustrates how timing of clearance can also have a negative effect on household livelihood assets, at least in the short term.

R: We could not eat the rice (after clearance) because the rice was mixed with soil and gravel. This soil and gravel come from UXO destruction because (when they did the clearance) the rice was already cut and drying in the field when they destroyed the UXO

I: You mean they destroyed the UXO where they found it?

R: Yes, the UXO was found in the dike (around the paddy) and they collected (the UXO) and placed them together and destroyed them, so the soil and gravel spread through the rice but they had told us not to take rice out beforehand. I have three plots of paddy field and all of them were contaminated. (ID1001)

Another potential negative impact is the current quota approach, means that only a certain number of households in a village receive clearance in a given year. It was often reported this can result in confusion as it is not always clear to people why one household was selected and not another. It can also lead to disagreement or discontent. As one person, expressing the view of several respondents explained, 'they complain, why did this man receive clearance but why not me?' (ID_0_2). It also results in expensive clearance resources being deployed to villages several times.

4.2.8. Demographic variables and impact

Statistical tests (ANOVA, Spearman's Correlation and Pearson Product-Moment Correlations)⁹ were undertaken to see if demographic variables were associated with reported level of impact. In our samples, demographic variables, for example, age, gender, sex of household head, do not seem to have a significant effect on outcomes. A similar finding was found in World Food Programme study (World Food Programme, 2007). As noted above, however, while the overall score on the livelihood sales was not significantly different between men and women there are some gendered aspects to post-clearance benefits depending on post-clearance land use. In Nong, respondents from combined/consolidated villages reported lower than average scores on the finance scale (statistically significant).

4.2.9. Time since clearance

The relationship between number of years since UXO clearance and reported perceived impact on each of the livelihood scales was explored using Spearman's Correlation. In Nong, there was a medium correlation between number and years and improved access to physical assets, $r = .42$ $n = 203$, $p = <0.01$. There were no significant associations in Pek and Paksong between number of years since clearance and reported impacts. In Pek however, there was a small association between respondents who had land cleared for individual household use and the Human Scale, $r = .27$ $n = 76$, $p = <0.05$, and individual household use and the Physical Scale, $r = .29$ $n = 400$, $p = <0.05$.

4.3. Who benefits from UXO clearance?

4.3.1. Accessing UXO clearance services

Looking at who accesses UXO services helps us to answer *who* benefits from UXO clearance. We have already seen that access to assets such as labour, equipment, seeds and finance affects how and when land is used as well as the type of specific benefits. Access to livelihood assets is also a factor in accessing services. The table below based on the qualitative data helps to illustrate this.

⁹ Statistical significance set at $>.05$

Table 6. Showing some quote related to accessing UXO clearance services

<i>Asset</i>	<i>Key terms</i>	<i>Characteristic response</i>
Human	Forms too complicated to complete	The forms are complicated, written in Lao and English
	Complicated process	I have reported (verbally) but have not had a response while others have(a written request is often needed)
	Lack of knowledge/ confidence	I am not sure if I can ask, not sure they will say yes
	Access to labour	You need to be able to clear the vegetation
Social	Knowing people working in the sector	I asked my friend who works for the UXO agency My neighbour works for the UXO agency
	Social/political position	I am the village head
Financial	No money	I am not sure if I have to pay
Environment	Area too small	They said the area was too small
	Area too large	The area is too large so we used other people's names on the request form

4.3.2. Personal characteristics

To build a program theory and look at *who* benefits from UXO clearance, we also need to look at the personal characteristics that may influence post-clearance land use. This part of the analysis was exploratory and used the qualitative data. As the table below shows, the three most important personal factors are:

- Awareness and participation (builds sense of ownership)
- Self-efficacy (belief that can do something)
- Task efficacy (belief that the activity is beneficial)

Table 7. Showing personal factors influence to post clearance land use

	<i>Key terms</i>	<i>Characteristic response</i>
<i>Reasoning</i>		
Awareness/participation	Participation, contribution, aware of UXO and service	The village requested the clearance /activity Villagers contributed labour
Self-efficacy	Believe have ability	Have skills, experience and training Know how to grow other crops Know about the market, exposure outside of village
Task efficacy	Believe worthwhile	There has to be benefits (especially if labour intensive)
	Evidence of success	See benefits e.g. increase in yield, more time, convenient Rice more beautiful

4.4. What contexts support post-clearance impacts?

A number of household factors have been identified which affect the way in which post-clearance, land is used and assets accumulated. There are also several broader socio-economic factors, which affect impact, and the extent to which any change is sustained. This part of the analysis also drew on the qualitative data. The main contextual factors are:

- Institutional policies/ practices
- Market stability
- Environment (e.g. soil quality, flood, drought, pests)
- Stage in livelihood transition
- Access to community assets

Table 8. *The main contextual factors support post clearance impacts.*

<i>Context</i>	<i>Key terms</i>	<i>Characteristic response</i>
Institutional practices	polices/ Changed land use – increases risk of exposure to UXO	There was no problem with UXO before but since it has been allocated for paddy there have been accidents
... Land use/allocation		People who cannot clear vegetation cannot have their land cleared
Recipient inputs	Labour to clear vegetation	It was time to plant and so I could not wait/seeds already prepared
... Timing	UXO is too late	Not sure if we have to pay
... Communication	Not clear about process	Not sure about the area of land they will clear
		Not sure how to request
		Not sure why land was not cleared, although requested
		Given rice to switch to paddy
		Seeds for different crops
... Incentives	Food/seeds for work/change practice	
Markets		
... Stability	Market price fluctuations	This year the price is down
		No market this year
Environment		
... Water	Access to water	We cannot extend because there is not enough water here
		The soil is not fertile in this village
... Soil	Soil quality	Beetles have attacked our crop this year
... Pests/disease outbreak	Pests attack crop	
Livelihood transition		
... Urbanization	Urban areas less agricultural production	In urban areas agricultural land is becoming built on

Access to community assets

... Communications	People need infrastructure to get goods to market	Without the road or transport people cannot get to market
... Irrigation	Irrigation/water	Irrigation is needed to increase production/use land for some crops (e.g. paddy)
... Knowledge	Knowledge/training/share experience	Need for knowledge of market and different farming techniques People with training share (esp if successful)

Changes in any of these contextual factors can either increase or decrease benefits. The extent to which benefits are sustained therefore depends on part on stability of the broader socio-economic environment. A number of institutional policies however can also be identified, including for example, improving communication and support for those with low labour availability to be able to access services.

4.5. Emerging program theory

From our analysis to date, we can begin to build a picture of who benefits from UXO clearance and in what ways as shown in the emerging program theories below. The figures below illustrate emerging theories based on clearance for farmland and clearance for a road:

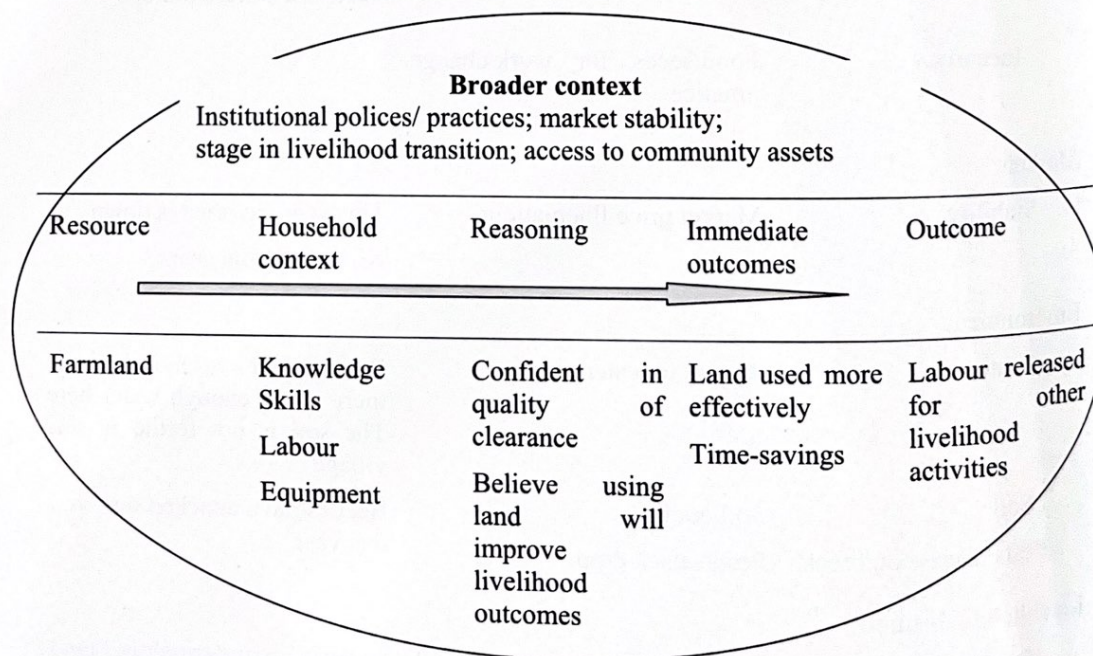


Figure 3. Emerging program theory when land is cleared for farmland

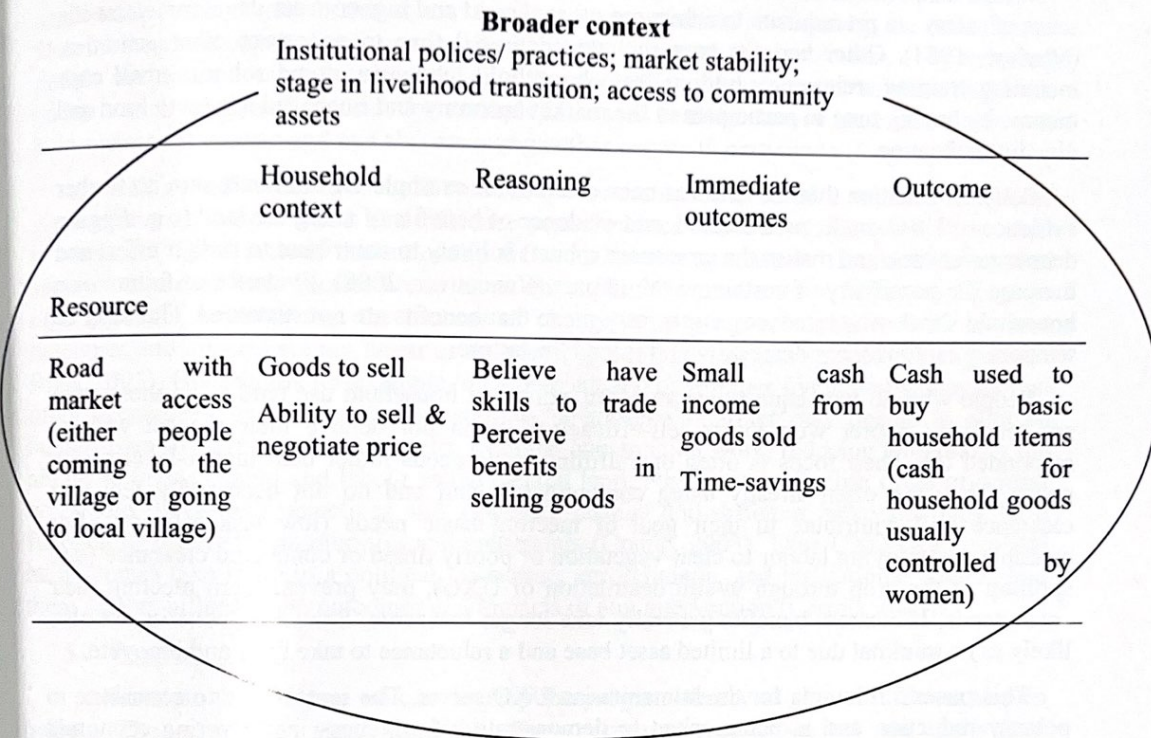


Figure 4. *Emerging program theory when land is cleared for a road*

5. Discussion and comments

This section begins by answering the overall research question. Included in this is the issue of sustainability. The section then considers effectiveness in terms of contribution to overall poverty reduction and reducing risk of UXO injury. Next the section comments on program relevance and efficiency.

5.1. Who benefits in what ways and in what contexts?

The assessment helps to understand who benefits from UXO clearance, in what ways and in what contexts. The assessment shows within communities, those who are relatively better off and already have their basic needs met, are more likely to access UXO services. People who have land cleared for individual household use, tend to be people with access to labour and equipment to clear vegetation¹⁰. They also have the skills and resources and are able to use their position in social networks to navigate the request process. With basic needs met, safety needs dominate, and they are motivated to request clearance. They have a degree of self-efficacy (e.g. believe they have the skills and knowledge to request clearance), believe their request is likely to be met with a positive response and that UXO clearance will contribute to achievement of their livelihood goals (task efficacy). Those with access to assets, especially labour, skills, knowledge, equipment, seeds, quality land, social networks and self and task efficacy are also better able to use the new resource (e.g. cleared land) to accumulate other assets.

¹⁰ An often quoted exception was MAG who pays through village assisted clearance for vegetation removal

Where clearance is for individual agricultural land, the biggest benefit is an increased sense of safety – a prerequisite to achieving other second and higher order development needs (Maslow, 1954). Other benefits may include, increased time to undertake other activities, including training, releasing children from household labour to attend school, small cash income by having time to participate in the market economy and improved access to food and diet diversification.

Self-confirmation that the land has been cleared, for example the land-user sees no further evidence of UXO on the area cleared, and evidence of benefits of using the land (e.g. digging deeper saves time and makes the crop more robust) is likely to contribute to further effort and increase the possibility of sustaining the impact (Vancouver, 2008). Evidence of failure or a household shock which reduces assets, may mean that benefits are not sustained. This may be temporary or permanent depending on reasons for failure.

People who do not request clearance for individual household use tend to be those who are relatively poorer with lower self-efficacy (e.g. do not believe their request will be responded to). Their focus is often on fulfilling basic needs rather than higher-level safety needs. They are often already using contaminated land and do not necessarily feel that clearance will contribute to their goal of meeting basic needs (low task efficacy). For example, redeploying labour to clear vegetation or poorly timed or conducted clearance (e.g. spoiling of the crop through in-situ destruction of UXO), may prevent them meeting their basic needs. If cleared, benefits generally take longer to accrue. Economic benefits are also likely to be minimal due to a limited asset base and a reluctance to take risks and innovate.

This poses a dilemma for the humanitarian UXO sector. The sector aims to contribute to poverty reduction and is being asked to demonstrate effectiveness in delivering economic benefits. The current quota system tends to favour the relatively well off and these people are more likely to have economic benefits, albeit, small economic gains within the context of a rural economy transitioning from a subsistence to a monetised market. A potential problem however is that the approach marginalises the poorest sections of the population even further. It also means that as the poorer sections of the community begin to meet their basic needs and turn their focus to safety needs, repeated deployment of expensive clearance assets to the same village may be made. It also fails to recognise other non-monetary impacts such as sense of safety, increased social assets through having some additional rice to share with others and increased effectiveness which can contribute to household investments in human capital, for example releasing children for school.

Clearance for community assets tends to be more equitable, in that in theory, the asset is for everyone to use, but not everyone is aware of clearance undertaken for a community project. Further, not all community-based assets are for the benefit of the whole community. For example, a small area may be cleared for a dam or irrigation, which is only used by a small number of households. Type of post-clearance land use will also affect the type of impact. For example, sub-surface clearance of a school ground or temple, may enhance individual, household and community sense of physical safety but its other direct impacts are limited. There may however be indirect impacts. An increased sense of safety for example, can help people focus on other livelihood needs. Clearance, which facilitates an all weather access road on the other hand, may bring an increase flow of information to the village, provide access to local markets and district facilities, reduce travelling time thus releasing labour for other activities and contribute to a small cash income. It also brings increased consumables into the village and with it, an increased need for cash.

As with individual plots of land, those who are relatively better off, with access to assets, including education, social assets and a level of self-efficacy, are likely to have more time to

allocate to using the new resource – in this example using a road, for instance to participate in small trade – are usually better able to maximise opportunities provided by the road. Roads also increase the flow of information to a village – crucial for innovation – by bringing people into more contact with for example, buyers, sellers, development workers and local authorities. Evidence of success, for example increased cash income or increased status will help sustain the change and can also encourage other people to participate (Rogers, 1983).

As well as individual household context, the assessment identified a number of broader socio-economic factors which can influence post-clearance impact and the extent to which it is sustained. These include institutional policies and practices, markets, the environment and seasons. Some of these factors are to an extent difficult to predict or to influence. They do help highlight however that the process of change from program inputs to land use and outcomes and impacts are not linear or an unambiguous, one-way progression (Cramb, 2003; Rigg, 2005). Households for example, may take advantage of other livelihood strategies that often accompany development. For example, a household farmer may decide to allocate labour to an off-farm work activity, for example construction work, reducing temporarily the ability to invest capital and labour in the cleared land. Further, over the life cycle of a rural household, livelihood objectives and strategies change and different behaviour may be a function of different opportunities and constraints (Cramb, 2003). Thus UXO clearance and its outcomes take place in a political, economic, agro-climatic, and institutional context and these factors influence the outcomes and impacts of any intervention (Cramb, 2003).

5.2. Program theory

Based on the analysis we can develop the program theory as shown in the examples below. The examples also highlight that outcomes are dependent on individual characteristics, household context, post clearance land use and the broader socio-economic context.

The figure below provides a general overview of the program theory. It shows how the program provides UXO cleared land and undertakes effective pre and post clearance communication and handover. This communication process helps build engagement, interest and a sense of ownership. It also helps build trust in the program. Engagement, participation and trust combined with access to assets and beliefs about the benefits of using the land, result in post clearance land use. As the landowner uses the land and sees no more UXO and sees benefits from using the land, she/he is likely to continue to use the land. Where a household has limited access to assets the immediate outcome might be an improved sense of safety and optimism – key for being able to access other development opportunities. Outcomes and impacts are influenced by the broader macro-environment.

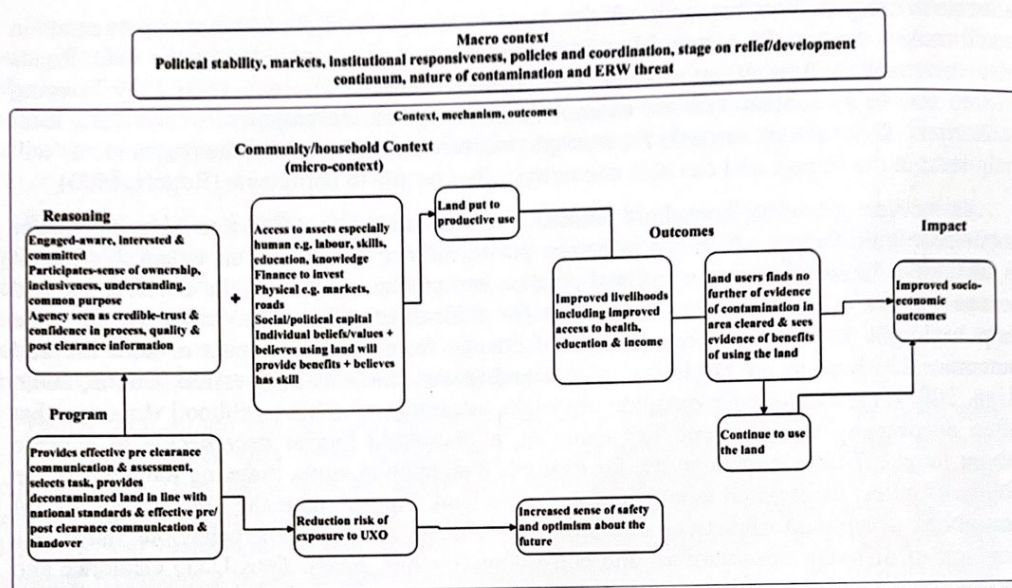


Figure 5. Overall program theory of the process from UXO clearance to outcomes and impact

The following two diagrams show the different outcomes and impacts when land is cleared for farming land or a road. As the diagram above they highlight the importance of the program providing effective communication and how household access to assets and beliefs also affect outcomes.

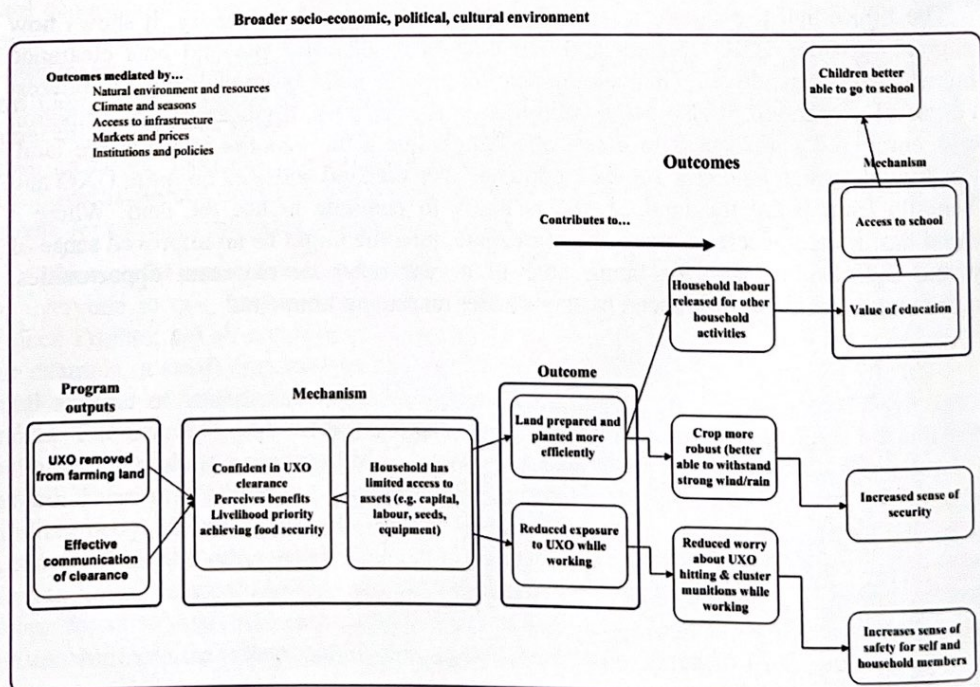


Figure 6. Program theory of the process from UXO clearance to outcomes and impact when land is cleared for farming land

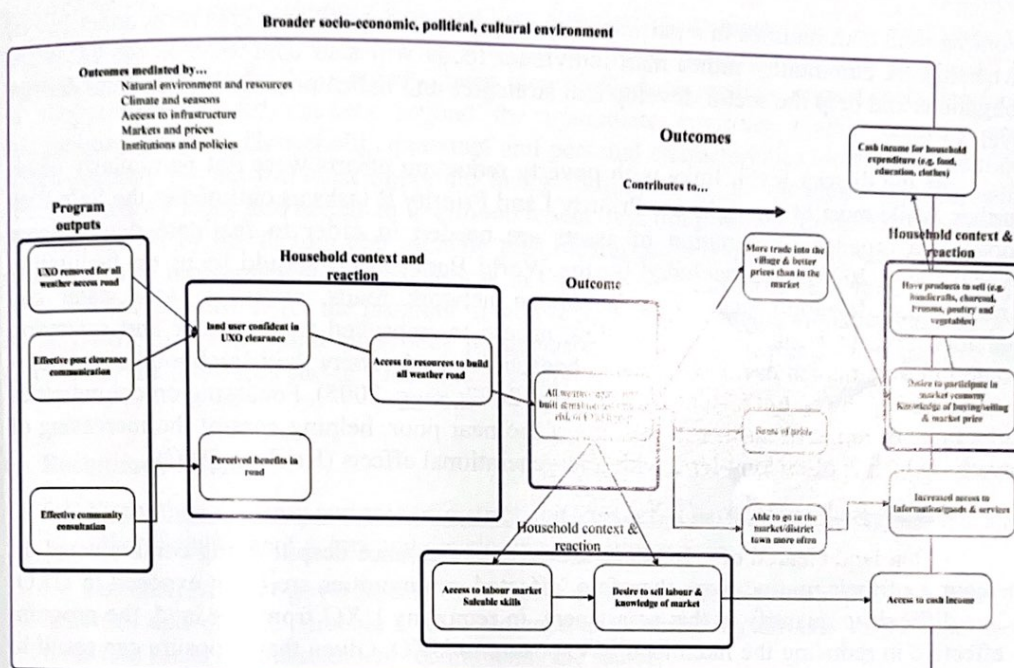


Figure 7. Program theory of the process from UXO clearance to outcomes and impact when land is cleared for a road

5.3. Program effectiveness

5.3.1. Contributing to poverty reduction

As has been discussed above, often the poorest sections of the community do not receive UXO clearance services for individual plots of land. Further, their generally limited access to assets often limits post-clearance economic benefits. Nevertheless, poorer household reported direct and indirect gains from clearance including social and human assets. Enabling farmers to use more efficient land preparation techniques through UXO clearance can also release labour for other activities. Having safety needs met people and seeing evidence of development, people are more likely to invest in human capital, for example, by sending children to school. Contributing to strengthening human and social assets are positive outcomes likely to have a long-term impact on improving financial assets and coping with the livelihood transition (Rigg, 2005).

Factors which the assessment team identified as limiting the sectors contribution to poverty reduction at the household level and which can be improved are poor communication and a complicated request system (from the perspective of a subsistence rice farmer with limited education). The current quota system aims to provide many villages with some level of service. As seen however, it also inadvertently favours those who are relatively well-off and is likely to have limited impact at the community or district level. A community based approach, where once in a village the operator clears all the land that is contaminated, or at least cluster munitions contaminated as these are the most common cause of non-tampering injuries, is likely to make a greater contribution to poverty reduction (Epprecht, et al., 2008; Krishna, 2007). Evidence of success in some households is also likely to contribute to willingness to try new opportunities by other households (Cramb, 2003; Rogers, 1983).

Working with communities in a participatory way will also increase engagement and sense of ownership. A community rather than individual focus will also contribute to the CCM (?) obligations and help the sector develop exit strategies and indicators at the village and district level.

At the district level, links with poverty reduction efforts were not particularly clear. Further, while most of the tasks are Priority I and Priority II tasks as outlined in the Safe Path Forward, a broader combination of assets are needed in order to facilitate development (World Bank, 2006). As concluded by the World Bank, effort should focus on facilitating infrastructure development, especially village network roads, access to safe water and sanitation (World Bank, 2006). Providing access to improved roads, water and sanitation would improve human assets and enable households to diversify their livelihood strategies – an important pathway out of poverty (Krishna, 2007; Rigg, 2005). Focussing on communities and a broader range of tasks will also assist the near poor, helping control the increasing of poverty- which is often long-term with intergenerational effects (Krishna, 2007).

5.3.2. Reducing risk of UXO injury

Often land cleared of UXO is in use prior to clearance despite being contaminated. In the course of their routine work therefore, affected communities are often exposed to UXO. While difficult to quantify in this assessment, in removing UXO from this land, the program is effective in reducing the likelihood of exposure to UXO. Given that exposure can result in injury and that managing the cost of a UXO injury and/or losing a labour unit from the household is potentially a catastrophic event, with intergenerational affects, this is an important outcome (Wagstaff & Lindelow, 2010).

5.4. Relevance

The program is relevant to Government priorities and its ninth Millennium Development Goal. The slow pace of clearance however, and the process of task selection and identification, make it less relevant to district, community and household needs in terms of contributing to poverty reduction and reducing risk of exposure to UXO as people are compelled to use contaminated land.

5.5. Efficiency

Cost efficiency or cost benefit analysis was not part of this assessment partly due to its limited application within contexts of rural subsistence economies (Harpviken, 2003; Paterson, et al., 2008). The quota system however means clearance assets are often repeatedly deployed to the same villages. Further, it is not possible to state that any villages or districts are 'impact free'.

To summarise, the humanitarian UXO clearance program in Lao PDR reduces fear and uncertainty when working in UXO contaminated environments. In this way, the program contributes to fulfilling people's basic human right to live and work in safety. Safety is also an important quality of life indicator and a prerequisite to fulfilling higher order development goals. Directly and indirectly, it also contributes to household and communities accumulating a range of household livelihood assets. Having a range of livelihood assets is essential if rural households are to successfully manage the transition to a market economy (Rigg, 2005).

The program contributes less directly to reducing poverty. One reason for this is that for a variety of reasons including misunderstandings about eligibility, the poorer household either do not request or are not prioritised for clearance activities. This is compounded by the quota system approach, which inadvertently, tends to favour the least poor within a community. In addition, limited effort is directed towards tasks categorised in the Safe Path Forward as

Priority III. These types of tasks however, are amongst those most likely to contribute to poverty reduction and are in harmony with district level poverty reduction strategies. A number of contextual factors have also been identified which mediate impact including lack of access to organised markets beyond the immediate environs, market stability and institutional policies. Household contextual and personal characteristics were also identified which mediate impact the most important being confidence in the clearance process, self-efficacy, task-efficacy and access to livelihood assets. It is not possible for the UXO program to influence all of the factors that mediate post-clearance land use and impact on poverty reduction. The recommendations that follow in the next section therefore is limited to those areas where it is possible for the program to intervene. The recommendations were developed at the District workshop and have been presented to subsequent workshops in each of the assessment site provinces and in Vientiane.

6. Recommendations

6.1. Strengthen capacity and role of district government in working with communities and other development actors and developing priorities

Currently, district governments do not play an active role in planning UXO clearance activities and do not perceive UXO clearance as contributing directly to their poverty reduction plans. The assessment recommends the following:

- Work with local authorities to identify the links between UXO contamination and development and the role of UXO clearance in supporting development (i.e. UXO clearance as a development facilitating activity)
- Raise awareness and work with district authorities to articulate the purpose of UXO clearance and criteria for task selection and prioritisation
- Raise awareness and develop capacity of district authorities to play an active role in planning and monitoring UXO clearance
- Strengthen networks and planning mechanisms between district, communities and operators
- Focus on range of community and district clearance needs in achieving poverty reduction (e.g. to facilitate access to water, roads, markets, public and private investment)

6.2. Apply community development principles to UXO clearance task selection and prioritisation

Currently there are many misconceptions about clearance, including who is eligible for clearance. It is not recommended that UXO operators undertake development activities such as building local infrastructure, agricultural extension or training. It is recommended however that the principles that underpin community development are applied in the clearance process from task identification to handover. The assessment recommends that operators:

- Involve community members in UXO clearance related activities:
- Promote inclusive community participation and engagement
- Strengthen role of community in determining priorities
- Village based rather than individual household approach (with additional roving capacity for other villages)

- Increase accountability of service providers to community
- Ensure processes enable the poor to participate (e.g. support with vegetation removal, effective communication, simple request procedures, VAC)
- Value non- monetary impacts
- Actively work to build community trust
- Support village level mechanisms to maintain records of activities, contaminated land etc (e.g. through village mapping) & monitoring progress
- Train staff in community development principles and practices

6.3. Monitoring and evaluation

Monitoring and evaluation is essential in ensuring that the program is achieving its objectives and reaching its target group. While there are well-established processes in place for monitoring the quality of the clearance process and product, there are no systematic processes in place for monitoring the other processes of task identification, community satisfaction, community participation and so forth. The assessment recommends baseline evaluation, process and outcome monitoring be undertaken. This will help address causality and will enhance the quality of future evaluations. Quantitative and qualitative data should be collected. Quantitative indicators are those which relate to quantity and can be counted. Qualitative indicators are those which relate to people's judgements and perceptions.

6.4. Baseline

Baseline indicators will be the same as outcome indicators and are covered under outcome indicators below.

6.4.1. Process monitoring

A key finding of this assessment has been that current participation and communication practices limit participation of the people the program aims to serve. Indicators of participation, effective communication and satisfaction are provided below. Data should be aggregated by sex, ethnicity and level of wealth especially at the household/community level.

6.4.2. Effective communication

When considering effective communication, the issue of gender should be taken into account. Communication for development interventions are highly gender sensitive. Often men and women have unequal access to information and it is vital to mainstream gender into all communication for development interventions. The very poor and poor also typically have less access to information so the communication strategy and monitoring also needs to take this into account. At the household, community and district level the following indicators could be used to monitor effective communication:

- Number of people who are aware of the service
- Number of people who are aware of the criteria for accessing the service
- Number of people who are aware of the process
- Number of household visits undertaken by clearance staff
- Number of people who feel they are able to access the service (have skills and are eligible)

- Percentage of people who have requested clearance
- Extent of leadership role undertaken by village head – e.g. did the village head help people apply for clearance
- Accuracy of the information reported by households
- Is the language of the communication appropriate for the population (ethnicity, level of education etc)
- Extent of dialogue and debate within households/communities about the UXO issue and areas to be cleared
- Number of community members (disaggregated by gender) who have participated actively in meetings/discussions about areas to be cleared and post clearance land use

6.4.3. Community participation

a. Individual level

Individual level – extent to which individuals feel they were involved in the decision-making process in which land should be cleared

Individual level – extent to which individuals feel they were involved in the planning of clearance

Individual level – extent to which individuals feel they understood the process and clearance undertaken

Individual level – information is easily available in an accessible format for all households to access

Individual level – individual households are given the support they need to access the UXO clearance services

b. Community level

Community level – community participation plan developed with community and operator

Community level – records of clearance undertaken maintained by the community and available for community members and organisations wanting to work with community

Community level – community map showing areas cleared

Community level – community volunteer system established and working effectively with regular liaison between operator and community volunteer

c. District level

District level – extent to which district feels it has been involved in the planning of UXO clearance

District level – extent to which district authorities understand the process and clearance undertaken

District level – information is easily available in an accessible format for all relevant district authorities to access and share with potential investors (donor, NGO, commercial)

6.4.4. Household/Community satisfaction

At the individual and community level, quantitative and qualitative information should be collected on:

- Satisfaction with clearance quality (from end user perspective rather than technical perspective)
- Satisfaction with timing of clearance (e.g. extent to which it disrupted other work due to timing)
- Satisfaction with quality and amount of participation and communication
- Satisfaction with task selection process and perceived fairness of process
- Satisfaction with behaviour of team while in village
- Satisfaction with their level of knowledge, general performance and helpfulness of the clearance operator
- Perception of the operator's staff's responsiveness
- Satisfaction that their needs have been met

6.4.5. Outcomes and impacts

The livelihood assets provide a useful framework that can be used to develop baseline data and monitor longer term outcomes and impacts at the household, community level and national level. At all levels of monitoring and evaluation, in low education settings and working with marginalised groups particularly, qualitative data is essential in understanding change and context (Mertens, 2010). Indicators should be developed and data collected on the five domains of the livelihood framework. The wide support for these indicator sets in the literature reflects an understanding that improved economic outcomes are dependent on improvements in these other factors (Ashley & Carney, 1999; Scoones, 2009; Sen, 1999). If an individual household approach is taken then the most relevant indicators used will depend on the purpose of land clearance and post-clearance land use. Where a community based approach is used a broader range of indicators will be selected. In general the indicators will be the same as those collected in the baseline.

a. At the local level

- Develop indicators with community
- Focus on interventions most likely to affect (based on type of post-clearance land use and livelihood systems)

It is important that qualitative data also be collected to help understand changes and those that are directly or indirectly related to clearance. Data should also be collected on the household and broader socio-economic factors which mediate impact to help demonstrate links between the indicator data and outcomes (Grootaert & van Bastelaer, 2001; Mertens, 2010). An issue in developing indicators at the household and community level is whether households and communities ought to be involved in determining indicators based on their worldview or whether they should be developed by outsiders. There tends to be a privileging of outsider perspectives (e.g. donors, government, operators), which may (or may not) effectively silence program recipients' views of their world and what is important to them. This concern has particular relevance to developing an indicator set for the rural poor whose experience of the world may differ quite markedly from those who live and work in the city and are often from different cultural, social and economic backgrounds. Cultural contexts is

known to affect how development is conceptualised and the indicators chosen to measure change.

The livelihood scale used in this research was developed based on qualitative research with communities and tried to represent their voice. Nevertheless, the final indicators and the examples below are from the research team. Program planners may decide to work more closely with communities to develop indicators but using the livelihood framework as a guide. Examples of indicators based on this assessment, the literature and the livelihoods framework include:

Human	<p>Average number of times UXO are found when farming</p> <p>Average number of times children report seeing UXO</p> <p>Number of UXO injuries</p> <p>Labour released for other activities (e.g. by provision of safe water after clearance, more efficient land preparation)</p> <p>Increase in proportion of children attending school (e.g. due to labour being released, improved food security, investments in school following clearance)</p> <p>Increased food diversity (e.g. number of times include vegetables in meal from area cleared for vegetable garden)</p> <p>Increased ability to provide 3 meals a day for all family members</p> <p>Ability to provide appropriate clothes for household members (e.g. able to provide cold weather clothes in cold season due to increase in income from released asset)</p> <p>Reported satisfaction with being able to meet basic needs</p> <p>Changes in yields</p> <p>Crop diversity</p> <p>*Number of people working outside village daily/capita</p> <p>*Number of people leaving village to work outside for extended periods/capita</p> <p>*Qualitative data also needed to see if this is due to distress or diversification of livelihoods due to improved access to labour markets/improved skills)</p>
Social	<p>Able to participate in village social activities without cost to basic needs (e.g. have enough rice to participate in social activities without hardship)</p> <p>Number of people/communities who have their basic human right to live and work in safety fulfilled by not living/working in UXO contaminated area</p> <p>Proportion of people in the community able to regularly participate in community events</p> <p>Number of times people report being able to go to the district/market</p> <p>Increased access to information through increased contact with people from outside of the village including NGOs</p>

	Extent to which feel part of and able to contribute to community Linkages to social/political groups
Physical	Changes in access to physical assets (e.g. road, water, markets) Improvements to home (for example through increased labour to work on home due to being able to farm more efficiently, less times spent moving goods to markets) Household property items improved or increased e.g. house improved, has motorbike, TV, hand tractor... Average travel time (or cost?) to nearest market/district centre
Finance	Changes in number of traders coming into the village Changes in cash income from on/off farm labour Increase in ability to purchase basic items Increase in ability to purchase non-basic items Reduced distress sales (e.g. selling good due to an emergency) Changes in the value of land
Environment	Area of productive land per capita without UXO contamination Area under irrigation as a result of access to water through clearance (e.g. clearance for weir, dam, irrigation canal) Average time saved per capita as a result of better access to water (e.g. if clearance has been to provide safe water supply/irrigation) Annual rice production (kg)/capita Improved quality of crops

It should also be noted that while financial capital is important to assess, people's perceptions of wealth tends to reduce as societies and individuals become more wealthy. This is because people adapt to increased access to material resources and as more consumables become available as a country develops, aspirations increase (Veenhoven, 2007). Further, while there is a general belief that economic development is inherently interconnected with development and well-being health and well-being, and there is evidence that supports the interconnectedness of wealth and well-being, there is not necessarily a direct correlation between the two.

b. Community level indicators may include

Human	Average number of times UXO are found when farming Average number of times children report seeing UXO Number of UXO injuries No of households categorised as very poor, poor, not poor Changes in school enrolment
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	Changes in children completing school Increased knowledge of labour market, farming practices
Social	Changes in demand for community support Changes in social equity Changes in village participation
Physical	Area of irrigated land/capita Changes in physical assets (e.g. tractor, bicycle) Number of functioning tractors/capita Accessible to market, road, Suksala, school and etc. Number of functioning water pumps/capita
Finance	Changes in aggregate community income Changes in expenditure in local business Changes in the number of village traders/small village business Changes in the value of land
Environment	Area of UXO cleared land in the community Increase in land under production Changes in crop diversity

c. *At the district level*

At the district level indicators should be based on key district level indicators and priorities and could include:

- Changes in the number of households considered very poor/poor
- Changes in the number of villages considered very poor/poor
- Number of villages with access roads/water/irrigation etc which have been facilitated by clearance
- Enrolment of school rate of children increased
- Changes in the number of UXO injuries
- Changes in the number of UXOs reported
- Changes in the number of communities with UXO impact
- Number of agriculture land increased

As with the local level the same principles will apply outlined earlier.

d. *At the national level*

- Use program theory to monitor and evaluate program

- Use livelihood scale (quick to administer, already tested for reliability and use with different ethno-linguistic groups)

In addition to the indicators mentioned here, the report strongly supports the recommendation of the MAG Gender Assessment that the Gender Guidelines for Mine Action and indicators be incorporated into the national program that all data should be disaggregated by sex.

6.4.6. In developing the monitoring and evaluation systems to avoid bias it is also important to:

- Use more than one indicator. For example only selecting one indicator from social assets does not indicate change in social assets.
- Use multiple sources and data types. To triangulate data it is important the qualitative and quantitative data is collected and that information and opinions are sought from a range of stakeholders
- To record good and bad outcomes and actively seek information for positive and negative outcomes.
- To assess aggregation and distribution, how benefits are shared and how useful they are to the diverse people who are sharing them.
- To emphasise the honesty of the process and address any doubts about the quality or coverage of information.
- Forms for survey, pre-clearance and post clearance should be standardised across agencies at least for minimum requirements

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