ASSESSING PERCEIVED WELL-BEING AND SAFETY OF A LAO RURAL COMMUNITY IN NAKAI, KHAMMOUANE PROVINCE AS A RESULT OF COMPLETED UNEXPLODED ORDNANCE (UXO) CLEARANCE AND RISK EDUCATION ACTIVITIES

By:

Thongkham Chanthavong

A thesis submitted in partial fulfilment of the requirements for the Degree of Master of Social Practice
UNITEC New Zealand, 2015
DECLARATION

Name of Candidate: Thongkham Chanthavong

This Thesis entitled: “Assessing perceived well-being and safety of Lao rural community in Nakai, Khammouane province as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities” is submitted in partial fulfilment for the requirements for the Unitec degree of:

Master of Social Practice

CANDIDATE’S DECLARATION

I confirm that:

- This Thesis Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

Research Ethics Committee Approval Number: 2014-1040

Candidate Signature:  
Date: 24 April 2015

Student number: 1415062
ABSTRACT

Unexploded Ordnances (UXO) left over from the Second Indochina War (SIW) between 1964 and 1973 still haunt the lives of those in affected communities by restricting access to agricultural land, and impeding the socio-economic and basic developmental status of the countries affected including Laos. However, in the last two decades, cooperation among governments and their development partners both locally and internationally to tackle the UXO issues has seen the decline in UXO casualties and improvements in a number of ways.

This study endeavours to assess the perceived well-being and safety of a Lao rural community in a village in Nakai district, Khammouane province, following a completed Unexploded Ordnance clearance and risk education activities. Through exploring the livelihoods and current living conditions of the villagers, the study sought to find out whether the UXO operations carried out by commercial operators about five years ago have made significant changes.

The field study was carried out in Laos from mid June to mid July 2014. A qualitative approach was used in this research study and semi-structured interviews were employed for the primary data collection with 11 voluntary participants. The data obtained were analysed through the use of thematic analysis.

The research findings of this study revealed that UXO operations conducted by commercial operators have had great impact on the respondents’ general well-being and safety. Essentially, the research showed that respondents could access agricultural land without the fear of hitting UXO. As a result, they have had safe land for generating farming products including rice, vegetables, and cash crops on which they rely. Moreover, UXO operations have produced pathways for a number of fundamental infrastructure systems to be established including the construction of road, a school, a healthcare centre, and a water supply system. Together, these components contribute to improving the living standards of the villagers.

The findings revealed that since the introduction of the UXO operations, there have not been any UXO-related accidents, neither in the village nor in the entire community of 17 villages in Nakai Plateau. However, the findings also revealed that a minority of the research respondents still come across some UXOs on the post-cleared land and they still appear to have touched and moved the UXOs found. These incidents suggest that the UXO operations including clearance and risk education (RE) carried out by the commercial companies needs to be improved and assessed by concerned organisations.
ACKNOWLEDGEMENTS

First of all, I would like to express my sincere gratitude to my principal supervisor, Gavin Rennie, for his consistent and ongoing efforts to support me during this research project and by providing expert comments on my work. I would also like to take this opportunity to thank my associate supervisor, Susan Elliot, who contributed a great deal of time and effort in order to help me make this study a quality piece of work. Without these two supervisors, this thesis could not have been satisfactorily completed. I feel very appreciative.

I would like to thank my lecturers who assisted me with my research topic and guided me through until satisfaction was met. I also would like to thank all my friends who shared knowledge, comments, and suggestions about the research process. I have learnt a lot from them and this will never be forgotten.

A special thanks to NZAID for providing me with the opportunity to study in one of the countries with the highest educational standard—New Zealand. The support from NZAID enabled me not only to pursue a Masters degree in Social Practice, but also to gain knowledge to conduct research that may benefit Lao rural communities affected by the threat of Unexploded Ordnances (UXO).

I am also grateful to the National Regulatory Authority (NRA) of Lao PDR. Its Director and staff contributed to this project by ensuring that I could carry out the research in Laos with ease. Without written permission from the NRA, this research could not have happened.

Thanks to the Chief of Nakai District Administration Office, Khammouane province, for providing me access to one of the villages. His written permission gave me, as the researcher, not only access, but also credibility since it demonstrated to the villagers that the researcher was not an intruder.

Finally, I thank my parents, Mr. Chanpheng Chanthavong and Mrs. Thongvan Chanthavong, my brothers and sister, and my wife Khamphong Phommachan who have always been understanding of what I have been doing, not to mention inspiring. Their supportive words from a distance have inspired me to pursue my dream. My wife had to live alone while I was away, so without her understanding, I could not have had this great opportunity to study in New Zealand. Thank you!
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<td>AAR:</td>
<td>Association for Aid and Relief</td>
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<td>ADB:</td>
<td>Asian Development Bank</td>
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<td>CA:</td>
<td>Community Awareness</td>
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<td>CCM:</td>
<td>Convention on Cluster Munitions</td>
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<td>CG:</td>
<td>Coalition Government</td>
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<td>CIA:</td>
<td>Central Intelligence Agency</td>
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<td>CMAC:</td>
<td>Cambodia Mine Action Centre</td>
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<td>CMC:</td>
<td>Cluster Munitions Coalition</td>
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<td>CMM:</td>
<td>Cluster Munitions Monitor</td>
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<td>CO:</td>
<td>Communist Organisation</td>
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<tr>
<td>COPE:</td>
<td>Cooperative Orthotic and Prosthetic Enterprise</td>
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<tr>
<td>CRS:</td>
<td>Catholic Relief Service</td>
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<tr>
<td>CISR:</td>
<td>Centre for International Stabilisation and Recovery</td>
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<tr>
<td>EOD:</td>
<td>Explosive Ordnance Disposal</td>
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<td>EQC:</td>
<td>External Quality Control</td>
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<td>ERW:</td>
<td>Explosive Remnants of War</td>
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<td>FDI:</td>
<td>Foreign Direct Investment</td>
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<td>FIW:</td>
<td>First Indochina War</td>
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<tr>
<td>GICHD:</td>
<td>Geneva International Centre for Humanitarian Demining</td>
</tr>
<tr>
<td>GoL:</td>
<td>Government of the Lao PDR</td>
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<tr>
<td>HCM:</td>
<td>Ho Chi Minh</td>
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<td>HCMCO:</td>
<td>Ho Chi Minh Communist Organisation</td>
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<tr>
<td>HDI:</td>
<td>Humpty Dumpty Institute</td>
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<td>HDI:</td>
<td>Human Development Index</td>
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<td>HI:</td>
<td>Handicap International</td>
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<td>HRW:</td>
<td>Human Rights Watch</td>
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<tr>
<td>ICBL:</td>
<td>International Campaign to Ban Landmines</td>
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<tr>
<td>IED:</td>
<td>Improvised Explosive Devices</td>
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<tr>
<td>IND:</td>
<td>Instituto Nacional De Desminagem (National Demining Institute)</td>
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<td>INGO:</td>
<td>International Non-Governmental Organisation</td>
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<td>IQC:</td>
<td>Internal Quality Control</td>
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<td>JMAS:</td>
<td>Japan Mine Action Service</td>
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<td>KAP:</td>
<td>Knowledge, Attitude, Behaviour</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>Lao PDR</td>
<td>Lao People’s Democratic Republic</td>
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<td>LC</td>
<td>Land Clearance</td>
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<td>LCMM</td>
<td>Landmine &amp; Cluster Munitions Monitor</td>
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<td>LDPA</td>
<td>Lao Disabled People Association</td>
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<tr>
<td>LN</td>
<td>Lao Neutralist</td>
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<td>LNSVA</td>
<td>Lao National Survey of UXO Victims and Accidents</td>
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<tr>
<td>MAC</td>
<td>Mine Action Canada</td>
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<td>MACCA</td>
<td>Mine Action Coordination Centre for Afghanistan</td>
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<td>MAG</td>
<td>Mines Advisory Group</td>
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<td>MAIC</td>
<td>Mine Action Information Centre</td>
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<td>MBT</td>
<td>Mine Ban Treaty</td>
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<td>MDGs</td>
<td>Millennium Development Goals</td>
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<td>MI</td>
<td>Medico International</td>
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<td>MLSW</td>
<td>Ministry of Labour and Social Welfare</td>
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<td>MoE</td>
<td>Ministry of Education</td>
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<td>MoFA</td>
<td>Ministry of Foreign Affairs</td>
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<td>MRE</td>
<td>Mine Risk Education</td>
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<td>NA</td>
<td>National Assembly</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<td>NIS</td>
<td>National Impact Survey</td>
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<td>NPA</td>
<td>Norwegian People’s Aid</td>
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<td>NRA</td>
<td>National Regulatory Authority</td>
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<tr>
<td>NRC</td>
<td>National Rehabilitation Centre</td>
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<tr>
<td>NS</td>
<td>National Standards (National UXO/mine Action Standards)</td>
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<td>NSEDP</td>
<td>National Socio-Economic Development Plan</td>
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<tr>
<td>NTPC</td>
<td>Nam Theun 2 Power Company</td>
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<tr>
<td>ODA</td>
<td>Official Development Assistance</td>
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<tr>
<td>PHR</td>
<td>Physicians for Human Rights</td>
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<td>PL</td>
<td>Pathet Lao</td>
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<tr>
<td>PLSW</td>
<td>Provincial Labour and Social Welfare</td>
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<tr>
<td>Project RENEW</td>
<td>Project Restoring the Environment and Neutralising the Effects of the War</td>
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<tr>
<td>QC</td>
<td>Quality Control</td>
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<td>QLA</td>
<td>Quality of Life Association</td>
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<td>QM</td>
<td>Quality Management</td>
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<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>RAF</td>
<td>Royal Army Forces</td>
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<td>RE</td>
<td>Risk Education</td>
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<td>RLG</td>
<td>Royal Lao Government</td>
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<td>RTM</td>
<td>Round Table Meeting</td>
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<td>SIW</td>
<td>Second Indochina War</td>
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<td>SODI</td>
<td>Solidarity Service International</td>
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<tr>
<td>TMC</td>
<td>Trosoe Mine Victim Resource Centre</td>
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<tr>
<td>TWG</td>
<td>Technical Working Group</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNICEF</td>
<td>United Nations International Children Fund</td>
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<td>UXO</td>
<td>Unexploded Ordnances</td>
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<td>VA</td>
<td>Victim Assistance</td>
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<td>VAP</td>
<td>Vietnam Assistance Project</td>
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<td>VAP</td>
<td>Vientiane Action Plan</td>
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<td>VD</td>
<td>Vientiane Declaration</td>
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<tr>
<td>VFA</td>
<td>Village Forestry Association</td>
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<td>VVAF</td>
<td>Vietnam Veterans of American Foundation</td>
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<tr>
<td>WE</td>
<td>World Education (or WES: World Education Consortium)</td>
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<td>WWI</td>
<td>World War I</td>
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<td>WWII</td>
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PROLOGUE

Being born in the countryside where the surroundings were heavily contaminated with unexploded ordnances (UXO), I was raised in a challenging and risky remote corner of Nambak district, Luangprabang province. I remember when I was around 10 years old; I was quite naughty and playful. One day I went fishing with some friends and we walked across the paddy field where we found something half buried on the ground near a muddy fish pond. We knew it was an explosive item, but none of us realised how dangerous it could be. We helped one another to dig up the object and threw it in the pond, expecting that it would go off and kill fish. Unfortunate! We exclaimed, as the object did not detonate and we did not get any fish. Now I realise that we were so lucky that the ordnance did not explode. If it had, my friends and I would not have been alive today. I found out later that the item is an 82 mm mortar projectile (as shown in Figure 1.), which was launched by a type of arsenal.

I remember hearing a number of ‘bangs’ when villagers burnt the forest in the season of slash-and-burn cultivation. I remember seeing villagers looking for scrap metal and selling it to wandering traders in order to make some extra income. Some people tried to dismantle a live UXO in order to get the parts which they said were bronze and would sell the parts to traders. Some people, particularly the blacksmiths, tried to turn the UXO fragments – which they claimed to be the best pieces of metal - into machetes, knives, and other kinds of tools. I also saw some people who were wounded or killed from the explosion of these weapons. In fact, I knew a man who was my father’s friend whose arm was cut when he attempted to open up the UXO in order to get the bronze part of it. I remember trying to get the powder out of an item so that I could make fireworks. I also remember using the empty 75 mm or 105 mm projectile shells as a boat anchor for fishing purposes. I did so by using one end of a piece of rope to tie around the hollow shell and the other end to the boat and dropped the shell into the river, making the boat stay still anywhere in the middle of the river and I could catch fish with a fishing rod. Fortunately, I never encountered a single explosion. However, it was unfortunate for many people who did not realise how hazardous these legacies of the war could be. Maybe it was because they got used to such problems and thought they were just
normal. Therefore, they were not afraid of them. Maybe they knew, but they did not have many choices as to how to live their lives.

I still have a clear memory of the method used by people in my village to grow vegetables. Walking through the village and glancing into the back yards, I would see vegetable growers made of bombie\(^1\) canisters. In fact, there is another half of the case in the back yard of my parents’ house today. The case is no longer dangerous, but it indicates that there could be bomblets that came inside the case left intact somewhere where the case was taken from initially. Some families, particularly those who are blacksmiths, still have their tools made from parts of UXOs, such as anvils made of 105 mm projectile bullets and other devices used in blacksmith work. Bomb craters can be found anywhere around the village, which show that the area was an intense battlefield during the war.

One day I went into the forest near my village with some friends to shoot birds with slingshots. As young children, we did not realise how dangerous that place could be. We found hundreds pieces of war debris including fighter plane wreckages, rusted big machine guns, bombie cases, big bombs, and old fuel tanks with bullet holes in them. We were trying to play with the objects while shooting birds. When we came back home, I told my grandfather where we went and what we had seen. He told us that the place was the airport used during the Nambak War, and he told us not to go there again because it was scattered with UXOs.

\(^1\)A bombie is a cluster sub-munitions bomblet, a conventional weapon consisting of the outer canisters designed to disperse smaller bombs, locally known in Laos as a bombie (Boddington & Chanthavongsa, 2010; Durham & Ali, 2008)
I went to a village school when I was seven. It was a wooden school where grade one and grade two shared the same class and a teacher. The roof was covered with grass that villagers wove. The walls were made of woven bamboo, which could be found around the village. Tables and benches were all made from bamboo. The school structure usually lasted for one or two years before it fell apart and villagers would help one another to build a new one. I was the youngest in the class but always was amongst the top students. When I finished grade two in the village, I had to continue grade three in another village where secondary school was available. I remember that my parents did not want me to go to the high school because I had to walk about an hour, and I was still too small at the age of eight. They wanted me to repeat the same class in the village school, but I did not listen to them and went off to school with some friends. I had no shoes to put on and so I beat up my brother because he would not give me his sandals to wear.

I walked to school every week day until I finished the second year of secondary school before my parents decided to get me ordained as a novice in the temple. I did not want to, but I had to obey my father’s instructions as he was a very angry man then. I became a novice when I was 13 and went to live in the temple in Oudomxay province. When I finished my last year at the Buddhist secondary school in Oudomxay, I was transferred to Lungprabang Buddhist high school, which is where I started to study English. In my three years at high school, I was always one of the top three students in the class. At the final exam in high school, I became the top student with the highest grade of all Buddhist school students in the whole country. I was told that I had made history for Lungprabang Buddhist School, which beat all other Buddhist high schools in Vientiane, Savannakhet, and Champasack. Because of my great achievement as a student, I was awarded a scholarship to continue my further education in Vientiane in 2001.

However, I only studied at the Buddhist College for a year before I left the novicehood. I then continued my study at the Lao-American College located in Vientiane capital where I majored in English and Humanities for four years. While studying at the college, I also wrote short stories in my free time. In fact, I wrote about six stories which were mainly about students’ lives, about young people and love. I got one of my stories published by a well-known publishing company in Vientiane after winning third place in a competition.

As soon as I graduated from the college, I got a job in a small book publishing company called ‘Big Brother Mouse’ as a writer and a translator. The company was actually half private and half charitable. There, I wrote a few books for young children both in Lao and in
English, and I translated many books including *Doctor Doolittle*, some stories of *Sherlock Holmes*, and many other western stories. Although I enjoyed my work, I could not stop pursuing my dream which I had hoped for since I was a young boy. My job with the publishing company lasted for two and a half years before I was approached by a UXO clearance company.

I was so thrilled when I received a phone call from the company even though it was just a call to arrange an interview. I was also amazed because I had not been contacted two and a half years earlier when I first submitted my application. However, I was the lucky person among several others after the interview. The company was owned by a New Zealand ex-military man who had extensive experience in the UXO field of operations. During my four and a half years working for the UXO clearance company, I got promoted many times as I was a very hard-working employee. I first worked as an interpreter with foreigners from many different countries. A few months later, I was promoted to a new position as a field administrator, and five months later as a project assistant manager. A year later, I was offered more responsibility and was appointed by the company’s director as a National Projects Manager. I was also in charge of Operations Management and Office Management when the company lacked managers in those areas. This is how I came to be involved in, and knew a lot about the company’s tasks; I experienced a wide range of situations relating to the UXO problems throughout the whole country.

After four and a half years with the company, I thought about strengthening my future and trying to do something else. I then applied for the NZAID Scholarship and was lucky that I received it. This is why I am here in New Zealand, studying for this degree in Social Practice. As part of the Masters qualification, I conducted this research which emerged from my work experience. I therefore came up with the statement relating to the UXO field, which is *Assessing perceived well-being and safety of Lao rural community in Nakai, Khammouane province as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities.*
CHAPTER ONE

INTRODUCTION

1.1. Overview of Laos

Laos is a small land-locked country located in the centre of the Indochinese Peninsula—the dynamic Mekong sub-region—bordering with five other countries (International Labour Organisation, 2011; Lee & Nanthavong, 2009). The East connects to Vietnam; the North West to Myanmar; the West to Thailand; the North to China; and the South to Cambodia (United Nations Development Programme, 2011). It has a land area of 236,800 square kilometres and as of 2013, the population sat at 6,695,166 with a growth rate of 1.63% (Central Intelligence Agency, 2013). Laos is divided into 17 administrative provinces (18 including the capital city—Vientiane) and 141 districts (United Nations Development Programme, 2011). Approximately, 70% of the country’s land mass is mountainous, particularly the north-eastern part. About three quarters of its population live in the rural mountainous areas and engage in agricultural activities (Government of the Lao PDR & The United Nations, 2013). However, in the last decade, subsistence agriculture has shifted to being market-oriented with a quarter of the farm households producing their farm outputs for sale (Government of the Lao PDR & The United Nations, 2013).

Laos obtained its independence in 1975 and has been led by a single party called the Lao People’s Revolutionary Party (Bertelsmann Stiftung’s Transformation Index, 2012). As one of the poorest countries in the world, Laos had been economically struggling until the massive reforms of its economic system in 1986 (United Nations Development Programme, 2007). The 1986 New Economic Mechanism (NEM) introduction has seen the country move from being centrally planned to a market-oriented economy (Friederichsen & Neef, 2010; Government of the Lao PDR & The United Nations, 2013). By applying the NEM, the
country was opened to foreign trade and investment, moved to a unified exchange rate, and allowed private sector and manufacturing to operate, plus received an increase in Official Development Assistance (ODA) and infrastructural investment (United Nations Development Programme, 2011). These reforms have assisted the country’s economy to grow at a considerable pace with a gross domestic product (GDP) growth of 6.4% annually throughout the 1990s and around 7.4% between 2001 and 2011 (Government of the Lao PDR & The United Nations, 2013). Laos is significantly rich in natural resources including forest (wood and wood products), mineral commodities (gold and copper), and hydropower potential (United Nations Development Programme, 2011). The natural resources sector contributed about 16.1% to the GDP in 2010 and is believed to continue to flourish in the foreseeable future. The other major GDP contributors include services 35%, agriculture 31%, and manufacturing 8% (Government of the Lao PDR & The United Nations, 2013). From 2011 to 2012, the 7th National Socio-Economic Development Plan (NSED) saw that Laos had obtained its GDP growth target of about 8% annually (Government of the Lao PDR & The United Nations, 2013). As a result, the Gross National Income (GNI) per capita sat at USD1, 130 as of 2011, which assisted Laos to move its status to a lower-middle income economy from its lower income status in the past decades.

Despite consistent economic growth, Laos is still recognised as one of the poorest and Least Developed Countries (LDC); it is ranked number 138 out of 194 countries in the world (United Nations Development Programme, 2013). Approximately, one third of the population still live under the poverty line (Howe & Sims, 2011; United Nations Development Programme, 2013). The poor status is a result of a number of factors. With 49 official ethnic groups consisting of 167 sub-ethnic groups, Laos is one of the world’s most ethnically diverse countries and ethnic minorities take up nearly half of the total population who mostly live in the rural mountainous areas (Friederichsen & Neef, 2010; Government of the Lao PDR & The United Nations, 2013; UNESCO, 2012; United Nations Development Programme, 2011). In addition, over 200 different dialects and languages are used by these minority groups; they have different cultural beliefs, traditions, and lifestyles (Government of the Lao PDR & The United Nations, 2013). These factors can become elusive obstacles to the country’s development schemes unless handled properly (United Nations Development Programme, 2011). Laos has also been involved in a number of wars in the past, notably the Vietnam War, which caused significant devastation to its people and basic economic and social infrastructure (Howe & Sims, 2011; International Labour Organisation, 2011). As a result, ensuring the security and safety of the population is a massive challenge (Howe
Sims, 2011; United Nations Development Programme, 2007, 2011). Essentially, Laos had only just gained its independence in 1975 after a long period of conflicts (Lee & Nanthavong, 2009). Since then, Laos has been struggling in terms of social and economic development in general, resulting in slow progress being made in poverty alleviation.

1.1.1. The developmental status of Laos

In its attempt to alleviate poverty, including UXO reduction, and to graduate from the list of the LDC, Laos has been heavily dependent on foreign capital and international assistance (Howe & Sims, 2011) in the form of grants and loans, such as Foreign Direct Investment (FDI) and Official Development Assistance (ODA) (United Nations Development Programme, 2007, 2011). A huge sum of external assistance in such forms has left Laos with a debt burden, but at a manageable level (United Nations Development Programme, 2011). According to the United Nations Development Programme (2007), UN agencies accounted for about 30% of multilateral funds, while the Asian Development Bank (ADB), the World Bank, and Japan—the three major donors—accounted for over 60% of the total ODA. The assistance disbursements focus on different priority sectors at both national and provincial levels by aligning with the five-year National Socio-Economic Development Plan (NSEDP) (United Nations Development Programme, 2007). In the last decade, the vast majority of ODA was targeted at facilitating the country’s economic growth; whereas, the education and health sectors were increasingly focused on in recent years. Currently, the assistance mainly flows to the administration of development and transport, education, and social development (United Nations Development Programme, 2007, 2011).

1.2. The Second Indochina War and the involvement of Laos

As a consequence of the First Indochina War (FIW) when Ho Chi Minh’s Communist Organization (HCMCO) attempted to oust the French from the northern part of Vietnam—Dien Bien Phu (which now borders the north-eastern part of Laos) - the French surrendered in 1954. These circumstances led to a conference in Geneva, Switzerland in that same year with the purpose of negotiating a settlement of the war (Khamvongsa & Russell, 2009). The war was broadly recognised as a conflict between the Western Democracies, including the United States of America and many of the European nations, and the Soviet Union and Chinese Communist Governments (Khamvongsa & Russell, 2009). The Geneva conference also led to the coalition of Lao Neutralists (LN) and the Pathet Lao (PL), who were based in the northern part of present day Laos and strongly backed by the Communist Organisation (CO), while the Royal Lao Government (RLG), who controlled the rest of the country, was
heavily supported by the Western Democracies. However, the 1958 election, which was an attempt to decide which government would rule the country, triggered the situation because the Coalition Government (CG), known as Pathet Lao, won the majority in the National Assembly (NA). As a result, the RLG and the United States were not happy and tried different ways to overturn the CG in the following election, which was to be held in 1960 (Khamvongsa & Russell, 2009; Pholsena, 2010). Before the election, the RLG, with support of the United States, attempted to organise several coups, which led to a number of conflicts. Because of circumstances at the time, in particular the fear of Communist invasion, Laos rather than Vietnam became the main target of the United States (Khamvongsa & Russell, 2009). The conflict situation kept spreading and subsequently led to the Civil War. The war escalation had led to the second Geneva Conference in 1961 and the agreements made in 1962 were to reaffirm that Laos was a neutral state. This meant that the country should not be controlled by other nations. However, the agreements only had minimal effect and the conflict on the ground still proceeded. As a consequence, the United States increased its support for the Royal Army Forces (RAF) in many tangible ways, including troop training, military supplies, and air cover (Khamvongsa & Russell, 2009; Pholsena, 2010).

With a base in the north-eastern part of Thailand, the United States was able to carry out bombing missions in North Vietnam in an attempt to stop the North supplying weapons and ideological material to the South (Pholsena, 2010). The Central Intelligence Agency (CIA) secretly hired private air companies in order to circumvent the Geneva Agreements. They maintained that the aircraft were delivering humanitarian aid when in fact they were supplying arms, supplies, and carrying out the bombing missions along the Lao-Vietnamese border (Heinze, 2013). This area was used by HCM troops and Pathet Lao, supported by the Soviet Union and China, to fight against South Vietnam which in turn was backed by the United States (Khamvongsa & Russell, 2009; Pholsena, 2010). The war went on for 10 years starting in 1964 and ending in 1973. It was in this year that the Ho Chi Minh troops and Pathet Lao declared victory over the United States and its allies (Casey-Maslen, 2004; Khamvongsa & Russell, 2009). When the war was over, more than two million tons of ordnance had been deployed, an estimated one third of which was left intact and continues to kill and maim thousands of people in countries involved in the war including Vietnam, Laos, and Cambodia (Khamvongsa & Russell, 2009; Mine Action Canada, 2009; National Regulatory Authority, 2011).
1.2.1. The threat of the war legacies

The SIW has left Laos with a staggering sum of ordnances that failed to detonate during the war and they still pose a threat to lives and the natural environment of the areas affected. Laos is recorded, per capita, as the world’s most heavily bombed nation (Howe & Sims, 2011; Khamvongsa & Russell, 2009; United Nations Development Programme, 2007; Wyper, 2012). Nine out of the 18 provinces were densely contaminated with UXOs left over from the SIW (Khamvongsa & Russell, 2009; National Regulatory Authority, 2012d). The UXOs have posed enormous challenges for the security and safety of individuals and put restrictions on the basic developmental and economic expansion of the country (United Nations Development Programme, 2011). The UXO-affected areas are mostly in remote mountainous locations where people heavily depend on subsistence agricultural practices and where a basic infrastructure system is rarely available (McGrath, 2000; United Nations Development Programme, 2011). As a result, remote areas have been left behind.

It is 40 years since the end of the SIW, but its legacy is still a barrier to the livelihoods of affected communities and the developmental expansion of Laos. Hundreds of innocent civilians have lost their lives during and after the war. In fact, 50,136 people have become the victims of this war with around 60% affected during the conflict and 40% after the war ended (National Regulatory Authority, 2011). Each year, around 300 people become victims of UXOs including injuries and deaths (Government of the Lao PDR & The United Nations, 2009). UXO presence is believed to be one of the causes that slows down the poverty alleviation efforts of the country as it blocks access to agricultural practices which the majority of Lao people are dependent on (United Nations Development Programme, 2007, 2009). In addition, UXO presence has restricted developmental projects such as road construction, water supply systems, and many other social and economic expansions (Mines Advisory Group, 2009; Özerdem & Roberts, 2012). Affected communities have to risk their lives on a day-to-day basis, as working on contaminated land is one of the few choices they have (Boddington & Chanthavongsa, 2010; United Nations Development Programme, 2009). This suggests that unless UXOs are cleared and risk education is provided, affected communities will continue to risk their lives in order to survive.

1.3. International involvement

The threats from UXOs have triggered concern from both nation state governments and international organizations throughout the globe. In 1992, six international humanitarian organisations, who had the common goal of mitigating the threat of landmines and cluster
munitions worldwide, came together as a group (Mine Action Canada, 2009; Mines Advisory Group, 2009). This group comprised Human Rights Watch (HRW), Handicap International (HI), Mines Advisory Group (MAG), Physicians for Human Rights (PHR), Medico International (MI), and Vietnam Veterans of American Foundation (VVAF). These organisations represented different perspectives towards UXO/landmine issues across the globe and they realised that a solution was needed to address the crises resulting from UXOs/landmines (Mine Action Canada, 2009; Mines Advisory Group, 2009). As a consequence of the partnership, an International Campaign to Ban Landmines (ICBL) was initiated with a primary objective - to internationally ban the use, production, stockpile, and transfer of anti-personnel landmines and later on the ban of cluster bombs. The group also attempted to put the campaign’s aims and objectives into practice. Today, the campaign is supported by over a thousand organisations from more than 70 countries who work locally, nationally, and internationally in the attempt to eliminate the threat of UXOs/landmines (Mine Action Canada, 2009).

In 1997, following the influence of the ICBL, the Ottawa Treaty was signed in order to strengthen the ICBL’s objectives and framework for putting the campaign into practice, including the clearance of UXO/landmine contaminated areas and assistance to affected communities (Mine Action Canada, 2009). The Ottawa Convention highlighted the aim of the ICBL as follow:

- To universalize the 1997 Mine Ban Treaty
- To fully and in a timely manner implement all treaty provisions
- To increase resources for stockpile destruction, demining UXO/mine risk education, and victim assistance sustained over the long-term
- To firmly establish the anti-personnel landmine ban as an international standard of behaviour by all.

To implement these objectives, in 2008, a conference for the Adoption of a Convention on Cluster Munitions (CCM) was held in Dublin, Ireland; it was open for signatures in the same year in Oslo, Norway (Convention on Cluster Munitions, 2008). The CCM came into force in 2010, and currently has 112 signatories, 83 of which are State parties to the Convention (Cluster Munition Coalition, 2013).
1.4 Lao policy towards the UXO impact reduction

The UXO operations in Laos began in the mid-1990s, but many problems occurred due to inappropriate management and a lack of support. In 1995, the ‘Trust Fund’ was established by the government in collaboration with UNDP and UNICEF in order to support the UXO operational tasks (Government of the Lao PDR & The United Nations, 2009). A year later, the Lao Unexploded Ordnance Programme (UXO Lao) was established as a government agency funded by the ‘Trust Fund’ (Durham, Gillieatt, & Sisavath, 2005; Government of the Lao PDR & The United Nations, 2009; United Nations Development Programme, 2007). UXO Lao programmes initially consisted of clearing agricultural land, marking and disposing of UXO found, providing risk education sessions for farmers and school children, and receiving reports from villagers who found suspected items. The operations were nearly 100% supported by the ‘Trust Fund’ (United Nations Development Programme, 2007). Even so, in 2002, the effort to reduce UXO impact encountered a crisis due to lack of a strategic plan and inadequate cost-effectiveness of the programme (Mine Action Canada, 2009), and the incredible length of time stated as needed to clear contaminated areas - 130 years (United Nations Development Programme, 2007). There was an absence of a detailed survey of the UXO-related issues. As a result, unnecessary land was cleared and a large amount of the budget was spent unnecessarily (Durham et al., 2005). The technology used in UXO-related operations was outdated, resulting in slow work progress (Durham et al., 2005). The crisis prompted donors to cease support and UXO Lao was forced to lay off a large number of its employees. However, an intervention by UNDP assisted the UXO reduction effort to get back on track. The intervention pushed the UXO Lao’s Steering Committee, in cooperation with UN partners and international donors, to initiate the strategic planning process; the Strategic Plan for UXO operations was established in 2003 (United Nations Development Programme, 2007).

The intervention of UNDP also led to the establishment of the National Regulatory Authority (NRA) in 2004 as a central UXO/mine sector (National Regulatory Authority, n.d-a; United Nations Development Programme, 2007), but operational tasks did not commence until mid-2006 (Griffin, Keeley, & Sayyasouk, 2008; Mine Action Canada, 2009; National Regulatory Authority, n.d-a). Operating under the Prime Minister’s Decree 406, NRA is responsible for providing policy, overall management, and coordination of all the UXO operators within the country (Government of the Lao PDR & The United Nations, 2009; National Regulatory Authority, 2012d). NRA has three overarching aims: to enable all UXO affected
communities to live and prosper without fear from UXO threat; to help assist and promote national development; and to see UXO victims fully integrated into society so that their needs are met (National Regulatory Authority, n.d-a). According to GICHD (2014), NRA has the following core specific responsibilities:

- To implement the Strategic Plan and carry out a periodic review
- To define and provide policy direction and formation
- To accredit, license, and oversee all UXO/mine action operators
- To manage the information and analysis
- To coordinate all UXO/mine action operators throughout the country
- To assess external quality assurance (QA) of all UXO/mine action activities and
- To conduct post-clearance impact assessments

Generally, the Millennium Development Goals (MDG) comprise eight major goals (Government of the Lao PDR & The United Nations, 2013). In Laos, however, to further address dilemmas emerging from UXOs, an additional goal for MDGs was adopted—UXO impact reduction (Government of the Lao PDR & The United Nations, 2010; United Nations Development Programme, 2011). This additional strategic goal consists of three main targets: “ensuring the complete clearance of UXO from priority/high value agricultural land by 2020; reducing substantially the number of casualties as a result of UXO incidents; and ensuring the medical and rehabilitation needs of all survivors in line with treaty obligations under the Convention of Cluster Munitions” (Government of the Lao PDR & The United Nations, 2010, p. 7). To achieve this strategic goal, the National Strategic Plan for the UXO sector 2011-2020 called Safe Path Forward II was established under collaboration between the NRA and international agencies, aiming to reduce all negative-related impact of UXO (GICHD, 2014; Landmine and Cluster Munition Monitor, 2012). The plan comprises six primary goals as follows:

- To mitigate the number of casualties from 300 a year to less than 75 a year;
- To ensure medical and rehabilitation needs of survivors are met in line with obligations under the Convention on Cluster Munitions;
- To release priority land and clear UXO in accordance with national standards and treaty obligations;
- To ensure effective leadership, coordination and implementation of the national programme;
To establish sustainable national capacity integrated fully into the regular set-up of the government; and

To meet international treaty obligations

Recently, a more effective work plan including the intense survey—the 2008 National UXO Survey—has helped concerned organisations to carry out their tasks more accurately regarding: the high contaminated areas and the number of UXO victims/survivors; the clearance focusing on high-risk locations; and more effective risk education. Together, these actions have led to a considerable reduction in casualties lately (Government of the Lao PDR & The United Nations, 2013). In addition, a clear strategic plan and management system have paved the way for more UXO humanitarian organisations and commercial companies to come into the country (National Regulatory Authority, 2008). According to the latest annual report from the National Regulatory Authority (2014), there are currently six humanitarian INGO UXO operators working in Laos. Based on the Safe Path Forward II, the main focus of the humanitarian organisations is on the UXO high contaminated land and includes agricultural tasks; roving activities; surveys; public service utilities such as health centres and water points; educational utilities; and other public infrastructure (GICHD, 2014). In addition, these organisations focus on providing risk education, victim assistance, and advocacy (Boddington & Chanthavongsa, 2010; United Nations Development Programme, 2012). According to the National Standards (NS), except for commercial companies, all UXO operators must operate their tasks based on prior contamination density surveys as specified in the Lao PDR’s MDG9, in the current UXO Sector Strategic Plan, or as directed by the NRA (National Regulatory Authority, 2012b). In addition, there are seven INGO operators focusing mainly on RE and VA (National Regulatory Authority, 2013). These operators have played a significant role in assisting people with disabilities resulting from UXO accidents throughout Laos (Boddington & Chanthavongsa, 2010; National Regulatory Authority, 2014).

Commercial UXO companies, both national and international, have also been established. Based on the Annual Report from the National Regulatory Authority (2014), there are currently eight commercial UXO operators in the country. The main focus of these operators is to clear the land subjected to developmental projects, which are implemented mostly by foreign investors within the country (National Regulatory Authority, 2013). These projects include mining, road construction, hydropower projects, tree plantations, and other basic
developmental projects belonging to INGOs when the humanitarian operators cannot provide the services in time (National Regulatory Authority, 2014).

The founding of the NRA demonstrates that Laos is committed to reducing the long-term impact of UXO contamination. This has also paved the way for UXO-concerned organisations, including commercial companies, to enter Laos. There were 14 UXO operators in 2006: one humanitarian government agency, three humanitarian INGOs, two international commercial companies, and eight humanitarian INGOs for RE and VA (National Regulatory Authority, 2006). Since 2010, the number of UXO operators has changed because some operators transferred their tasks to other organisations, while some national commercial companies have emerged (National Regulatory Authority, 2011). According to the report from the National Regulatory Authority (2014), the number of the UXO operators had increased to 22 by 2013. The detail of these operators is shown in the tables below.

1.4.1. Current UXO operators in Lao PDR

Table 1: Humanitarian UXO operators

<table>
<thead>
<tr>
<th>No</th>
<th>Operators</th>
<th>Short names</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lao National Unexploded Ordnance Programme</td>
<td>UXO LAO</td>
<td>Public</td>
</tr>
<tr>
<td>2</td>
<td>Halo Trust</td>
<td>HALO</td>
<td>INGO</td>
</tr>
<tr>
<td>3</td>
<td>Handicap International</td>
<td>HI</td>
<td>INGO</td>
</tr>
<tr>
<td>4</td>
<td>Japan Mine Action Service</td>
<td>JMAS</td>
<td>INGO</td>
</tr>
<tr>
<td>5</td>
<td>Mines Advisory Group</td>
<td>MAG</td>
<td>INGO</td>
</tr>
<tr>
<td>6</td>
<td>Norwegian People’s Aid</td>
<td>NPA</td>
<td>INGO</td>
</tr>
<tr>
<td>7</td>
<td>Solidarity Service International</td>
<td>SODI</td>
<td>INGO</td>
</tr>
</tbody>
</table>

Table 2: Humanitarian risk education and victim assistance operators

<table>
<thead>
<tr>
<th>No</th>
<th>Operators</th>
<th>Short names</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Association for Aid and Relief</td>
<td>AAR</td>
<td>INGO</td>
</tr>
<tr>
<td>2</td>
<td>Cooperative Orthotic and Prosthetic Enterprise</td>
<td>COPE</td>
<td>NGO</td>
</tr>
<tr>
<td>3</td>
<td>Centre for Medical Rehabilitation</td>
<td>CMR</td>
<td>Public</td>
</tr>
<tr>
<td></td>
<td>(National Rehabilitation Centre)</td>
<td>(NRC)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>World Education</td>
<td>WE</td>
<td>INGO</td>
</tr>
<tr>
<td></td>
<td>(World Education Consortium)</td>
<td>(WEC)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Catholic Relief Services</td>
<td>CRS</td>
<td>INGO</td>
</tr>
<tr>
<td>No</td>
<td>Operators</td>
<td>Short names</td>
<td>Types</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>ASA Power Engineering Co., Ltd</td>
<td>ASA</td>
<td>National</td>
</tr>
<tr>
<td>2</td>
<td>Bactec Lao Ltd</td>
<td>BACTEC</td>
<td>International</td>
</tr>
<tr>
<td>3</td>
<td>Phonhsackda UXO Clearance Co., Ltd</td>
<td>PSD</td>
<td>National</td>
</tr>
<tr>
<td>4</td>
<td>Sibounheuang UXO Clearance Co., Ltd</td>
<td>SBH</td>
<td>National</td>
</tr>
<tr>
<td>5</td>
<td>Sengphet UXO Clearance Co., Ltd</td>
<td>SP</td>
<td>National</td>
</tr>
<tr>
<td>6</td>
<td>XTD UXO Clearance Co., Ltd</td>
<td>XTD</td>
<td>National</td>
</tr>
<tr>
<td>7</td>
<td>Milsearch Lao EOD Sole Company Limited</td>
<td>Milsearch</td>
<td>International</td>
</tr>
<tr>
<td>8</td>
<td>Engineering Department, Ministry of National Defence associated with MMG LXML</td>
<td>MMG</td>
<td>International</td>
</tr>
</tbody>
</table>

Table 3: Commercial UXO operators
1.5. Overview of Nakai, the research location

Nakai, broadly known as Nakai Plateau, is one of the 10 districts of Khammouane province. Situated in the middle part of Laos and about 450km away from the capital city of Vientiane, Nakai covers the country’s largest national protected area known as ‘Nakai Nam Theun National Protected Area’ (Robichaud, 2013; Rockwood, Stewart, & Diatz, 2008). Nakai Plateau is an area where approximately 5,684 people representing 1,030 households live (Nam Theun 2 Power Company, 2013b; Robichaud, 1995). Based on the report from the The World Bank (2004), Nakai was identified as one of the poorest districts in Laos with the average household income of USD450 in 1998, which was far below the national poverty line at USD800. The Second Indochina War is blamed as one of the causes of poverty in this area as it left behind a substantial amount of UXOs, preventing residents from cultivating land (Rockwood et al., 2008). Because of its ethnic diversity with at least 28 dialects in four main linguistic groups, Nakai was believed to be one of the longest inhabited areas of Laos or Vietnam (Robichaud, 2013). Despite the differences in ethnicities, people in this area share common lifestyles and rely on a mix of agriculture including shifting slash-and-burn and paddy cultivation, hunting, and collecting forest products (Robichaud, 1995, 2013).

There has been a significant impact on the Nakai plateau, particularly on the social and livelihood systems of the resettled households since the commencement of the resettlement programme introduced by Nam Theun 2 Power Company (NTPC) between 2007 and 2009 in order to make way for the dam project (Schneider, 2014). This project was initiated in 1995 and implemented over a 10-year period. It has been regarded as a model project of sustainable development due to its huge potential for stimulating economic growth, poverty alleviation, and environmental protection of the country (The World Bank & Asian Development Bank, 2010). The active involvement of GoL, private sector companies, NGOs, and two major multilateral financial institutions - the World Bank and the Asian Development Bank - has made this industrial project strong, especially regarding its
economic, social, and environmental characteristics. It was commercially operated from April 2010 and became the largest single source of foreign income to Laos (Phonepraseuth, 2012; The World Bank & Asian Development Bank, 2010).

Despite its social, economic, and environmental potential focus, 16 villages around the dam reservoir had to be resettled. Based on the impact assessment carried out by the NTPC and an independent agency, over 2,700 households have been directly affected by the project (McDowell, Scudder, & Talbot, 2012; Phonepraseuth, 2012). This means that the project construction resulted in the loss, temporarily or permanently, of residents’ properties including houses, forest, businesses, agricultural land, and cultural assets (McDowell et al., 2012; Phonepraseuth, 2012). To compensate for all the losses created by the dam project, a resettlement package to address all issues was provided by the NTPC (The World Bank & Asian Development Bank, 2010, 2011). Even so, concern over the new livelihood and socio-economic systems has remained as resettled villagers need assistance to adapt to the new environment (McDowell et al., 2012; The World Bank & Asian Development Bank, 2010).

As a former war zone during the Second Indochina War, Nakai was heavily contaminated with a large number of UXOs, and these have added an extra cost to the development (Howe & Sims, 2011; United Nations Development Programme, 2012). In this sense, the NTPC has spent over USD16.7m on the UXO operations in its project area (Mine Action Canada, 2009). During 2005 and 2009, commercial UXO operators were contracted by the NTPC to intervene in the area and start UXO activities as part of its project implementation (Nam Theun 2 Power Company, 2005). Currently, villages in Nakai are living a much better life thanks to the NTPC resettlement project, which offered residents a substantial amount through assistance packages (Nam Theun 2 Power Company, 2013b; The World Bank & Asian Development Bank, 2011). However, assessment of the impact of UXO clearance and risk education on development has not been conducted although the link between UXO action and development has been frequently referred to (GICHD, 2014). Therefore, it is interesting to investigate whether or not the UXO operational intervention has made significant changes to the lives of the villagers, particularly in terms of their well-being and safety.

1.6. Rationale

Through my experience working in the field of UXO operations for nearly five years, I found that UXOs have become an arduous obstacle to many developmental activities. I found that
jobs had to be suspended whenever the ordnances were found in a work location, which caused delay in work progress. Villagers had to risk their lives to work in their gardens and paddy fields because they had few other options. Some people used their own techniques to avoid UXO danger by covering the items up with dirt or leaves so that children would not see and play with them. Some people were not afraid of the objects and attempted to turn them into equipment such as machetes, knives, and lanterns. Some tried to sell UXO fragments to wandering traders, and the metal eventually ended up in the foundries.

In Nakai where this research study took place, I saw that it was one of the most heavily UXO-contaminated places in Khammouane province. A staggering number of UXO items were found, removed, and destroyed. Personally, I believe that many places around the area are still contaminated with UXO. Therefore, I chose one, in particular, of the 17 resettlement villages in Nakai as my research location. I also noticed that, once UXO operators entered the area, things started to change. However, problems were still observable, such as children playing with UXOs and other UXO-related issues. These issues triggered my intention to further discover the reasons behind these incidents, thus the topic of my study is Assessing perceived well-being and safety of a Lao rural community in Nakai, Khammouane province as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities. The details of the study are as follows:

1.7. The aims of the research study

(1) To examine the living conditions and safety of villagers in Nakai after the completion of UXO clearance and risk education.

(2) To assess the perceived association between UXO presence/absence and social, economic, and developmental status in Nakai.

(3) To demonstrate that, from the experience in this location, whether or not UXO operations conducted by commercial companies have had a significant impact on
villagers’ livelihoods and how UXO clearance and risk education activities could have been improved.

1.8. The objectives of the research study

(1) To find out the key issues of UXO presence in relation to the villagers’ safety and living conditions.

(2) To analyse the differences between Nakai residents’ living conditions and safety before and after UXO clearance and risk education.

(3) To investigate the effectiveness of UXO-related operations conducted by commercial companies on the villagers’ livelihoods.

(4) To investigate factors that may help villagers to utilise the UXO cleared land more productively.

(5) To find out elements that may help UXO clearance and risk education to be more effective based on the views of the research respondents.

1.9. Research questions

In order to achieve its aims and objectives, this research focuses on three main questions:

1. What are the significant changes as a consequence of the UXO operational intervention in Nakai in relation to the well-being and safety of residents and social, economic, and developmental conditions before the risk education and UXO clearance?

2. What was the effect on the well-being and safety of residents and social, economic, and developmental conditions as a result of risk education and UXO clearance?

3. How could the process of the risk education and UXO clearance have been improved for other villages in the future?

1.10. The process of the information sought

The research study is based on a qualitative approach to draw out information regarding changes to the location after the UXO operations. Semi-structured interviews were utilised for the primary data collection. The semi-structured interviews helped the researcher to uncover a broad range of data relating to the situations that people have experienced in their lives. Through the interviews, I wished to examine the well-being and safety issues across
different groups of people within Nakai; for example, farmers and people from other occupational groups within the village.

1.11. Data collection time frame

The field work for data collection commenced at the beginning of June and ran through to early July 2014 (nearly a month). During this period of time, 11 participants voluntarily took part in the study. The researcher also took the opportunity to take some pictures of the rice fields and gardens of some families where there was no agricultural activity in the past as the places were heavily contaminated with UXOs. The situation in the field was difficult as it rained nearly every day and the researcher had to walk about 10 km a day to and from the research location, plus the village was very quiet as most villagers were out in the jungle most of the day time. However, the data gathering mission was completed within the one month time frame.

1.12. Organisation of the thesis

In addition to Chapter one, this thesis comprises four other chapters.

Chapter two provides a summary of the literature related to the research study. The literature review focuses on six main points relating to the UXO issues. The first part reviews the history of the research location and its involvement in the war followed by definitions of the key terms used in this study. The chapter also presents the threat of UXO worldwide and how international organisations react to the circumstances in order to mitigate the issue. Then the literature relating to UXO problems in Laos and their relation to people’s lives, correlations with poverty, and social, economic, and developmental aspects are critically presented. This is followed by detail of the UXO reduction strategies created by the government of Laos in cooperation with international agencies and the private sector. The final part focuses on the extent of UXO-related operations and how much these operations have contributed to the development of the country in general.

Chapter three focuses on the research methodology and methods employed in this research study. The study utilised a qualitative approach as a guideline and the chapter provides reasons why the method is appropriate to the research topic. In this qualitative research, the study used semi-structured interview for data collection, and a thematic analysis approach was used to analyse the data. The chapter also outlines the sample selection process and ethical issues involved in the research study.
Chapter four presents the study results stemming from the semi-structured interviews used to gather information from villagers in Nakai. It shows participants’ perspectives and experiences regarding UXO issues and the changes made to the village after the intervention of the UXO operations.

Chapter five includes the discussion and analysis of the findings. Recommendations which may be useful for the UXO-related operations in the future are also provided, followed by conclusions of the study.
CHAPTER TWO

LITERATURE REVIEW

INTRODUCTION

The first chapter provided a brief background of Lao PDR and outlined some key issues involving UXO circumstances. The chapter included the purpose, aims, objectives, and research questions. The methods of data collection and analysis were also briefly described.

This chapter addresses the literature relating to the research study. The chapter begins by how the researcher went about the literature search and discussions of terminology used in this study. This is followed by the exploration of UXO issues nationally and internationally and how international agencies express their reactions towards UXO impacts. In addition, a history of Nakai and its relation to the war was briefly identified. Essentially, how UXO presence has threatened socio-economic and developmental circumstances in Laos is critically evaluated. The chapter also addresses the extent to which Laos has tackled the UXO issues within the country.

In this chapter, the researcher explored different kinds of sources relating to the UXO literature in order to find relevant information to review literature that supports this research focus and to indentify gaps in which this research study lies. The sources were mainly extracted through Google Scholar where a number of academic electronic books, journals, newspapers, previous research studies, and reports relating to the UXO were found. Many of the sources were also explored through the university’s online library database and websites of the UXO concerned organisations. This has provided a substantial number of information needed to review the literature concerning UXO issues throughout the world including Laos and the research location where communities have been affected by the threat of UXO and landmines.

2.1. Terminology used in relation to UXO

2.1.1. Community well-being in the post-conflict zone

In many countries around the world, the well-being of people living in the current/former conflict zones has been in a critical condition. Consequences of the wars have affected communities in a number of ways (Baird & Billion, 2012). Howe and Sims (2011) contend
that the UXO threat has been recognised as a ‘poverty multiplier’ as it continues to pose a critical challenge to fundamental development, creates barriers to socio-economic expansion, and hinders the security of communities, resulting in the poor well-being of citizens. Community well-being is constituted by a number of factors including good socio-economic status and social security or safety (Gough & McGregor, 2007; Prilleltensky & Prilleltensky, 2007). Likewise, Hothi, Bacon, Brophy, and Mulgan (n.d) maintain that the seven most influential factors of well-being are: family relationships, financial situation, work, community and friends, health, personal freedom, and personal values. However, in the UXO-contaminated areas, such as Nakai, the threat from UXO has hindered people’s livelihoods as it: increases rebuilding costs; prevents them from accessing agricultural land, water sources and irrigation channels; harms the productivity of individuals and communities; and delays basic development projects. And all of these are the key factors contributing to community well-being ( Howe & Sims, 2011). As a result, individuals living in the former war zone are struggling to achieve prosperity.

2.1.2. Safety

Safety means one is free from danger and risk of UXO/landmines (Mine Action Canada, 2009). In the UXO-contaminated areas throughout Laos, safety of communities has been blighted due to the threat of UXO presence. However, UXO operations have provided safe environments for the affected communities (Mines Advisory Group, 2006). It is also widely acknowledged that people can fully access their land to perform their daily agricultural activities and children can play around safely after the UXO operations (CARE Australia, 2010; Mines Advisory Group, 2009).

2.1.3. Unexploded Ordnance (UXO)

Unexploded Ordnances refer to explosive weapons such as bombs, shells, grenades, and cluster bombs which are launched, dropped, or fired and are supposed to explode, but failed yet are still ready to go off and kill or injure if disturbed (Boddington & Chanthavongsa, 2010; Mine Action Canada, 2012). McGrath (2000) defines UXO as any item holding explosives of any sort which has been launched or dropped by plane from an inappropriate height or at the wrong speed and did not explode, or has partly discharged, or that has been deserted in any situation. Soft surfaces such as mud, sand, weeds, bushes, and water could be some of the reasons why many explosive devices have not detonated yet they still pose a threat if disrupted (Winright, 2009).
2.1.4. Unexploded Ordnance Clearance

The term ‘Unexploded Ordnance Clearance’ refers to an activity that leads to the removal of UXO hazards and/or the release of known or suspected UXO contaminated land. Such activities include: surveys; recordings; markings; clearance, including mechanical and Explosive Detection Dog (EDD) clearance; UXO disposal; community liaison; and the handover of released land (National Regulatory Authority, 2012b). It involves the act of searching or detecting UXO items with a specially designed detector (Boddington & Chanthavongsa, 2010; National Regulatory Authority, 2013), machine, or a well-trained dog (Durham et al., 2005). When the items are detected, technicians manually search for them by using shovels or specially designed tools, and the technicians carefully dig with their specially trained skills, and then destroy or remove such items to a safe place and dispose of them afterwards (Boddington & Chanthavongsa, 2010; Landmine & Cluster Munition Monitor, 2012). Sometimes the term is recognised as referring to UXO operations which comprise ‘clearance’, ‘survey’, and ‘risk education’ (National Regulatory Authority, 2013). In some countries, the term is broadly known as ‘mine action’ (Mine Action Canada, 2012), which comprises five main components: UXO/mine clearance and survey; risk education; stockpile destruction; victim and survival assistance; and advocacy. All these activities aim to address issues encountered by individuals as a consequence of UXO/landmine threats (Durham & Ali, 2008; Durham et al., 2005; Roberts & Littlejohn, 2005).

In the process of the UXO clearance, many delicate tasks are required and these can affect the environment and involve people living in the contaminated areas with the scene. Jaenig (2010) explains that the clearance involves forest slashing which in turn affects the environment. In Laos, the majority of UXO clearance takes place in the existing subsistence agricultural areas. Hence, a large area of forest will not be destroyed. In places where developmental projects take place, however, some parts of the forest have to be cut to make way for the clearance. According to the NS—Worksite Preparation, clearing vegetation prior to the UXO clearance is permissible, but the NS stipulate the following: individuals involved in the vegetation cutting must be supervised by a qualified technician; a prior surface check for obvious UXOs must be carried out where practicable; and a safety brief must be given to all personnel involved in the vegetation cutting, for example, only an upward motion to be used in cutting, hoe or digging type tools must not be used, and any suspicious object found must be reported to the technician (National Regulatory Authority, 2012c).
Based on the NS, the post-cleared land is to be technically randomly checked by a qualified technician supervisor using the same detector being used during the task and this will cover 10% of the area cleared (National Regulatory Authority, 2012a). This procedure is called ‘Internal Quality Control (IQC)’. In addition, an External Quality Control (EQC) is to be carried out by the UXO/mine Action Sector/NRA qualified personnel. The procedure is similar to that of IQC, but the check is to cover 2% of the area cleared. This is to ensure that the cleared land, which will later be released for use, meets the procedure specified in the NS (National Regulatory Authority, 2012a).

2.1.5. Risk Education

Risk Education (RE) or Mine Risk Education (MRE) is an information and awareness raising activity that UXO operators and other concerned organisations provide for affected communities regarding UXO dangers (Boddington & Chanthavongsa, 2010; Durham & Ali, 2008). The RE activity aims to teach people to avoid hazardous activities by focusing on vulnerable groups of people in society, such as farmers and scrap metal collectors including children (Boddington & Chanthavongsa, 2010; Durham & Ali, 2008; United Nations Development Programme, 2009). It also consists of advice about special methods and techniques that farmers may utilise in their farming activities including how to use tools in a more correct manner (United Nations Development Programme, 2009). The sessions, particularly in Laos, usually comprise playing games, puppet shows, drawing pictures, asking and answering questions relating to UXO, and giving small gifts. RE programmes are mostly based on two major strategies: public awareness approaches which include traditional and mass media; and educational approaches whereby the awareness is raised through schools (Durham et al., 2005). RE has become an essential component of UXO clearance activities and the efforts to reduce the negative impacts caused by UXO, mines, and other Explosive Remnants of War (ERW) (Boddington & Chanthavongsa, 2010; Durham & Ali, 2008; Mine Action Canada, 2009). Based on the annual report from the National Regulatory Authority (2014), RE has significantly contributed to the declining figure of UXO casualties. With the NRA’s monitoring missions through its Technical Working Groups (TWG) in cooperation with the Ministry of Information and Culture (MIC), the RE messages can be broadcast through radio to many vulnerable groups of people in UXO-contaminated areas.

2.2. Unexploded Ordnance issues internationally

Unexploded Ordnances and landmines have long been a major issue in most of the countries that used to be conflicts zones (Gibsons et al., 2007; Howe & Sims, 2011; Osterlind, 2008).
UXOs and landmines are also known as ‘legacies of war or Explosive Remnants of War (ERW)’ because they are left over by the conflicts (Casey-Maslen, 2004; Mine Action Canada, 2009) and, although buried in the ground for several years, they still pose a threat to all living beings, particularly to people who disturb the objects. According to Landmine & Cluster Munitions Monitor (LCMM), the most dangerous types of UXO are those cluster bombs locally known in Laos as *bombies* (ICBL & CMC, 2013a). The *bombies* came packed in a canister containing roughly between 600-700 small bomblets - depending on the types - and each bomblet contains around 300 metal ball bearings designed to propel over a wide radius upon impact (Durham & Ali, 2008; Durham et al., 2005). When the canister is dropped from the plane, it disperses the bomblets indiscriminately in all directions over a large area and claim both military personnel and civilian victims (ICBL & CMC, 2013a). In Laos, the most common types are BLUs including BLU23, BLU24, BLU26, BLU61, and BLU63 which weigh less than 20 kilograms each (National Regulatory Authority, n.d-b). These cluster bombs account for the majority of UXOs dropped on Laos and 30% of the incidents in the last decade have been caused by these types of bombs.

In many countries throughout the world, although conflicts ended decades ago, UXOs and landmines are still posing an imminent threat to people’s lives, claiming both military personnel and civilians’ lives and becoming a barrier to the development of the countries affected (Mine Action Canada, 2012). Since the end of the World War II (WWII), at least thirty-six nations and four disputed territories have been affected by the presence of UXOs, particularly the cluster munitions and anti-personnel landmines (McKinlay, 2010). Through to the end of 2012, 17,959 casualties resulting from cluster munitions were identified worldwide. Amongst this figure, civilians accounted for 94%, 84% of whom were males, and the proportion of children sat at 40% of the total (ICBL & CMC, 2013b). The deadly UXO/landmines left from the conflicts not only kill and maim individuals, but also hinder the social, economic, and developmental status of the countries affected (CARE Australia, 2010; Harpviken, Millard, Kjellman, & Skåra, 2003; Mines Advisory Group, 2009; Roberts & Littlejohn, 2005). Usually, the nations affected are those amongst the poorest in the world and the UXO threat is claimed to be the impediment to the social, economic, and environmental aspects of those countries as it slows down the development and poverty alleviation efforts in general (Mine Action Canada, 2009; Mines Advisory Group, 2009). In 2008 alone, cluster bombs, landmines, ERW, and improvised explosive devices (IED) claimed 5,197 casualties worldwide (McKinlay, 2010). In 2012, 3,628 casualties were reported in 62 countries and regions with 1,066 victims killed and 2,552 people injured, and
out of these figures, children accounted for 47% (ICBL & CMC, 2013b). However, in many countries, the number of child casualties exceeds the overall world average. For instance, in India, children constituted 72%, while in Somalia it is 70%, and 65% in Sudan (ICBL & CMC, 2013b). It is likely that there could be more unreported casualties, especially in the most heavily affected nations due to a number of factors including unavailability of information and inaccessibility to casualties who live in remote corners of those countries (Howe & Sims, 2011; Osterlind, 2008). It is stated that the primary cause of UXO-related accidents comes from the sensitive fusing system of the items and their appearance, including the colours, shapes, and metal content which attract playful attention, tampering, or collection (ICBL & CMC, 2013a).

2.2.1. The case of Vietnam

Laos may be the most heavily bombed country per capita, but Vietnam is the most cluster munitions-affected country in the world (ICBL & CMC, 2013b; Mine Action Canada, 2009). It was recorded that the United States dropped 413,130 tons of cluster bombs during the war, covering 55 provinces and cities (ICBL & CMC, 2013b). However, contamination has never been precisely estimated due to the intense and widespread bombing missions (Mine Action Canada, 2009). According to a Handicap International (HI) Report in 2007, by 1975 in Vietnam, 294 cluster munitions were dropped per square kilometre which accounted for roughly two bomblets per citizen (McKinlay, 2010). It was reported by the Vietnamese Ministry of Labour, Invalids and Social Affairs that, from 1975 to 2007, following the end of the Second Indochina War, UXOs and landmines had claimed 38,849 deaths and maimed 65,852 victims in Vietnam (Center for International Stabilization and Recovery, 2012). In 2010, according to LCMM, there were 42 reported casualties with eight killed and 34 injured; and in 2011, it reported that 31 people became the victims with 14 killed and 17 injured (Center for International Stabilization and Recovery, 2012). However, recently, UXO operators including NGOs have given hope to a number of affected communities. For instance, according to PROJECT Restoring the Environment and Neutralizing the Effects of the War (Project RENEW), in 2012, its clearance capacity exceeded the previous year of 250% (180,000 square metres cleared in 2012) and disposed of 568 UXO items in Quang Tri province – one of the heaviest contaminated areas in Vietnam (Project RENEW, 2013). The cleared land was used to grow cash crops such as acacia trees. In addition, roving teams have also destroyed 3,557 items found in villagers’ gardens, plantations, rice fields, and roadsides. Moreover, Project RENEW has brought over 4,000 children from remotes areas to attend
UXO risk education at the Mine Action Visitor Centre to learn about UXO awareness (Project RENEW, 2013). The report stated that cooperation with individuals, governments, and other UXO operators such as NPA, Humpty Dumpty Institute (HDI), Tromsoe Mine Victim Resource Centre (TMC), and Vietnam Assistance Project (VAP) was the key to success as Project RENEW has learned better approaches and utilised the most cost-effective methods for its UXO activities (Project RENEW, 2013). However, an assessment regarding the impact of UXO operations on well-being and safety has not seriously been conducted in the areas.

2.2.2. The case of Cambodia

In Cambodia, it was estimated that around four to six million landmines were laid under the ground and it was recorded as one of the world most landmine-contaminated countries (Cambodia Mine Action Centre, 2011; Merrouche, 2011). According to the National Impact Survey of 2002, contamination covers 4,544 square kilometres including other types of ordnances deployed during the conflict (Cambodia Mine Action Centre, 2011; Roberts & Littlejohn, 2005). Landmine contamination was blamed for hobbling the school attendance of children through many channels (Merrouche, 2011). It also is a primary cause of impoverishment in the remote affected areas because landmines block communities from accessing agriculturally fertile land (Roberts & Littlejohn, 2005). In addition, a lack of facilities has made it difficult for injured victims to be treated properly, which results in permanent disabilities (Merrouche, 2011). Recently, with the collaboration of and support from international agencies and NGOs, UXO/landmine operations in these countries have given hopes to millions of lives, particularly farmers and those in other development sectors. For example, the mine operation sector in partnership with NGOs and other international organisations has brought about the possibility for the construction of much infrastructure including the construction of roads that link countryside to towns, the building of fish ponds, and the training of local people to substantially increase agricultural activities (Cambodia Mine Action Centre, 2013). In addition, according to Mines Advisory Group (2012b), in Sam Lout, Cambodia, before MAG entered into the area, people had been living on small pieces of land and were unable to grow enough crops to feed family members; but following this intervention, the people in this community were busy with agricultural activities such as planting corn, sugarcane, banana trees, and other types of crops on the land cleared by MAG. More importantly, the number of victims in Cambodia has also steadily declined from 1,153 in 1999 to 181 people in 2012 (Cambodia Mine Action Centre, 2012). Yet, there is still
concern that the mine and UXO threat has significantly impacted on the development of the country in general and is an impediment to the development of the domestic economy and its participation in the global economy (Merrouche, 2011; Roberts & Littlejohn, 2005).

2.2.3. The case of some African countries

Meanwhile in Africa, due to several internal conflicts and wars, several nations have been facing significant UXO/landmine problems (Kindig, 2002). According to Mine Action Information Centre (MAIC), 30 out of Africa’s 54 countries have been encountering UXO/landmine contamination, with Angola, Chad, Egypt, Ethiopia, Eritrea, Mozambique, Zimbabwe, and Somalia the most severely affected (Kindig, 2002). In Mozambique for instance, the ERWs are a legacy of conflicts that lasted for nearly 30 years and just ended in 1992 (Mine Action Canada, 2009). The UXO/mine contamination covers a large area of land; however, poor survey and inaccurate data collection systems produced wrong information, resulting in the unnecessary clearance of areas and the spending of a huge sum of the budget (Mine Action Canada, 2009). The Baseline Assessment took place in 2007 and 2008 and reduced contaminated areas down to 12 square kilometres. Like other UXO/mine affected nations, most of the contaminated areas are on agricultural land and the victims are mostly non-combatants, such as farmers and children (Mine Action Canada, 2009). According to Landmine Monitor, 447 casualties had been identified between 1999 and 2008; while the National Demining Institute (Instituto Nacional De Desminagem—IND) identified 285 casualties during the same period (Mine Action Canada, 2009). This caused suspicion that the data between the two organisations overlapped, which made information unreliable at the time. However, the RE programme was considered valuable in Mozambique as it was believed to help save the lives of people in contaminated areas (Mine Action Canada, 2009). The report also showed that, in 2005, although an assessment carried out by GICHD advised that RE should be integrated with UXO/mine clearance tasks, UNICEF reported there was no longer a need for RE in the country.

2.2.4. The case of the Middle East

In the Middle East, the countries affected by UXO/landmine include Lebanon, Iraq, Afghanistan, Syria, and other former conflict nations (Mines Advisory Group, 2009). For example, in Afghanistan—the birthplace for humanitarian mine action (Heinze, 2013) - a large number of UXO/landmines were left over from the Soviet War during 1979-1989 (Mines Advisory Group, n.d), several internal conflicts during 1992-1996 (Heinze, 2013;
Mine Action Canada, 2009), and lastly from the United States who dropped an estimated amount of 1,228 cluster munitions containing roughly 248,056 sub-munitions\(^2\) between 2001-2002 (ICBL & CMC, 2013a). It is estimated that over 2,300 communities with over 4,000,000 people have been affected by UXOs/landmines in Afghanistan (Mine Action Canada, 2009). According to the Mine Action Centre for Afghanistan, from 1999-2008 at least 12,069 casualties as a result of UXOs/landmines were reported, which included 1,612 killed and 10,457 maimed (Mine Action Canada, 2009), and 36% of the casualties were innocent children (McKinlay, 2010). Like other contaminated countries, UXO/mine presence in this area prevents access to necessary livelihood assets, resulting in an increase in vulnerability (Paterson, Pound, & Ziaee, 2013). Recently, some countries – Israel, Libya, Myanmar, and lately Syria – have been found to still be using these weapons in conflicts (Landmine & Cluster Munition Monitor, 2012).

From reviewing these case studies in different parts of the world, certain similarities become apparent. The UXO/mine threat has a significant impact on and is an impediment to the socio-economic and developmental status of the countries affected. UXO presence prevents communities from accessing agricultural land where they grow rice, crops, and vegetables as a means of food and income generation (Andersson, Sousa, & Paredes, 1995; Gibsons et al., 2007). UXOs have killed and maimed innocent people including children, affected both the physical and psychological aspects of the victims, and caused a long-term negative impact on the families (Osterlind, 2008; Wyper, 2012). Yet, tackling the UXO/mine issue costs requires large budgets and so necessitates a strong level of assistance from, and cooperation between, all concerned local, national, and international organisations (Gibsons et al., 2007; Mine Action Canada, 2009).

### 2.3. International reaction to the UXO/landmine issues

Widespread UXO/mine issues have sparked concerns amongst many organisations and international bodies throughout the globe. ICBL, in cooperation with other NGOs, came together and organised the Cluster Munitions Coalition (CMC) and pushed for further action towards the eradication of anti-personnel mines and cluster munitions in the Oslo 2008 Convention on Cluster Munitions (CCM) (ICBL & CMC, 2013a; Mine Action Canada, 2009). CMC is determined to take up the responsibility which aims to change the policy and practice of governments and organisations throughout the world and to raise public awareness.

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\(^2\)Sub-munitions refer to bomblets or a type of ordnances contained in canisters. The term is also known as ‘cluster bombs’ (Mine Action Canada, 2009)

Following the Oslo Convention, the First Meeting of States Parties to the Convention on Cluster Munitions (1MSP) was held in November 2010 in Vientiane, the Capital City of Laos where 108 nations signed the treaty (Cluster Munition Coalition, 2010; McKinlay, 2010; National Regulatory Authority, 2011). The aim of the meeting was to strengthen cooperation and oblige those signatory nations to ban or cease producing, disposing of stockpiles, clearing contaminated areas, and assisting victims (Ferrie, 2010). However, only 46 states have ratified this so far and the U.S is among those who are not signatories of the Treaty (McKinlay, 2010; Ward, 2010). The Convention brought together a total of more than 1,200 delegates from all over the world including states parties, UN agencies, international organisations, civil society, and cluster bomb victims; and it enforced four documents including Vientiane Action Plan (VAP), Vientiane Declaration (VD), Work Programme 2011 (WP), and Reporting System, which all emphasise more actions on UXO/mine problems (RS) (Cluster Munition Coalition, 2010; National Regulatory Authority, 2011). VAP and VD, in particular, are the main documents generated from the meeting. With the consultation of the UN, the International Committee of the Red Cross (ICRC), and CMC, VAP aims to ensure that the Convention can have an immediate impact, take into account the current implementation issues, and react to upcoming developments; it has as its objective to ensure effective and timely implementation of the CCM provisions (Convention on Cluster Munitions, 2010). To fulfil its aim, the states parties agreed on the following actions: partnerships; universalisation\(^3\); stockpile destruction, clearance and disposal of ERW and the organisation of RE activities; victim assistance; international cooperation and assistance; action in support of implementation, transparency and exchange of information; national implementation measures; and compliance (Convention on Cluster Munitions, 2010). While VD - which is represented by states parties and witnessed by other parties’ representatives, the UN, CMC, ICRC, and INGOs - emphasises the state of contamination and its long-term

\(^3\) Universalisation refers to the act of making the world aware and support the campaigns against UXO/landmines (Convention on Cluster Munition, 2010)
threats to life and the development of the nations affected, and how the UXO/mine presence impedes the achievement of MDGs (Convention on Cluster Munition, 2010).

As of September 2013, 112 nations had acceded to the 2008 Convention and, out of these, 83 nations are states parties while 29 counties have signed, but not yet ratified the Convention (Cluster Munition Coalition, 2013). Those non-signatory nations, which include the United States, Russia, and China—the three major mine producers—are opposed to a complete mine ban while telling others to sign the Treaty (Casey-Maslen, 2004). They argue that cluster bombs are effective military devices upon which the safety of their armies relies. The United States claimed that these types of weapon were designed to self-destruct or deactivate, which is why they called them “smart” cluster bombs, and that the bombs help reduce the risk to non-combatants (Ferrie, 2010). Taylor (2011) maintains, to the contrary, that cluster bombs kill and maim approximately 4,000 non-combatants each year in the UXO/mine-affected nations such as Laos, Vietnam, Cambodia, Kosovo, Iraq, and Afghanistan. In fact, according to Handicap International’s research, 98% of the victims are civilians, nearly half of whom happen to be children (Taylor, 2011). McGrath (2000) believes that the strategy of UXO/landmine utilisation is intentionally targeting the Third World countries where victims are mostly civilians who rely heavily on agricultural practices.

### 2.4. Unexploded ordnance issues in Laos

#### 2.4.1. How heavily bombed was Laos?

In Laos, although the war ended forty years ago, the presence of UXO continues to threaten people’s lives and the livelihoods of the affected communities, and impedes socio-economic and developmental schemes (Howe & Sims, 2011; Osterlind, 2008). In the last few decades, although concerned organisations, including INGOs, government agencies, and the private sector, have made efforts to tackle the issues, problems are still apparent. This is particularly the case where UXO clearance and RE activities cannot be provided due to several difficulties. These include limited transportation systems, remoteness of the contaminated locations, limited communication channels (United Nations Development Programme, 2007), and minimal funds to operate the tasks (National Regulatory Authority, 2011). Another main reason is because several areas are too heavily contaminated, making operations progress slowly (National Regulatory Authority, 2012d). In fact, based on the 1973 United States Military Data, Senate Congressional Record, 580,344 bombing missions loaded with 2,093,100 tons of explosive devices were dropped on Laos between 1964 and 1973.
Within this figure, over 270 million cluster sub-munitions including a large number cluster bombs—the most common form of UXOs—were dropped on the country (National Regulatory Authority, 2013; United Nations Development Programme, 2009). It was estimated that approximately one-third of the ordnances dropped failed to explode during the war, but they still pose a threat to lives (National Regulatory Authority, 2011; Osterlind, 2008; Sisavath, 2006). The war has claimed over 50,000 deaths of which 60% occurred during the war and 40% since the end of the conflict (National Regulatory Authority, 2012d; United Nations Development Programme, 2007). Since the end of the war, an average of 300 people, most of whom were farmers and innocent civilians, have become victims of UXO annually (Mines Advisory Group, 2009; National Regulatory Authority, 2012d). Recently, UXO-related accidents have still occurred in many areas throughout Laos where UXO operations have not been undertaken. Although the number of incidents continues to decline, as well as the number of victims, it is still considered too high for complacency and the issue needs to be further addressed (Latsaphao, 2014). The latest annual report from the NRA shows that the number of UXO victims sat at 41 in 2013, down from 56 in 2012 (National Regulatory Authority, 2014). It is stated in one of the strategic objectives that the UXO/mine sector expects to reduce the UXO casualties from 300 victims to 75 per year (Government of the Lao PDR, 2012). The evidence shows that this objective is well on track in accordance with the MDG 9th (Latsaphao, 2014). In spite of this, the UXO problem is still considered a vital issue that needs to be addressed, particularly since the problem is believed to be associated with the poverty of the country (Government of the Lao PDR & The United Nations, 2009).

2.4.2. Nakai and the war

Nakai, a former fighting zone during the SIW, is one of several places in Laos where UXO contamination became an obstacle to livelihoods of villagers. Xiengkhoun province may be recorded as the most heavily bombed area in Laos (Khamvongsa & Russell, 2009; National Regulatory Authority, 2011), but Nakai is the place where the most ordnances were found per square metre, especially the bombies. Nakai is one of 10 districts of Khammouane province listed as the most heavily bombed provinces in Laos (National Regulatory Authority, 2011). Nakai became one of the fighting zones between the Ho Chi Minh Communist troops and American armies (Robichaud, 1995, 2013). With the north-eastern part sharing a border with Vietnam, Nakai lies in between North and South Vietnam where the Ho Chi Minh trail went through during the war (Robichaud, 1995, 2013). Thus, the place was targeted by the severe
aerial bombardment of the United States military as they attempted to cut the supplies of the Ho Chi Minh troops between the north and the south (Rockwood et al., 2008). Therefore, Nakai became a scapegoat of this notorious war. Howe and Sims (2011) maintain, through COPE’s interviews with some Nakai residents, that UXO was identified as the problem that people encountered as it restricted land access and forced residents to overuse the non-contaminated land, which made the land unfertile and yielded fewer products. As a result, many villages in Nakai had been struggling in terms of agricultural expansion due to the threat of UXO until the intervention of the UXO operational organisations in the past decade.

2.4.1. Social, economic, and developmental consequences of the UXO presence

The threat of UXO has put restrictions on different kinds of development in Laos. Achieving economic growth has been arduous; maintaining infrastructure has been hindered; livelihood safety has been undermined; and access to agricultural land has been prevented or restricted making the day to day lifestyles of affected communities critically elusive (Howe & Sims, 2011; McGrath, 2000; Özerdem & Roberts, 2012). The safety and security of people’s lives have been blighted by the substantial number of cluster bombs (United Nations Development Programme, 2011). McGrath (2000) contends that there is clearly a connection between the UXO/Landmine problem of cultivating land and the economic circumstances in the countries arising from war where farming restoration is a crucial factor in regeneration. Food security issues will inevitably exist, resulting in a shortage of domestic food products if farmers cannot access the land on a wide scale (Howe & Sims, 2011; McGrath, 2000). In addition, opportunities to expand projects, such as hydropower plants, mining, forestry, tourism, and other areas that are considered as the key growth engines of development, have been restricted or made more expensive (Government of the Lao PDR & The United Nations, 2009; Marciel, 2010; United Nations Development Programme, 2009). The implementation of development initiatives has to be delayed (United Nations Development Programme, 2009) and many infrastructure projects are postponed unless an extra budget is made to cover the cost of UXO clearance (Boddington & Chanthavongsa, 2010; Howe & Sims, 2011). For instance, Nam Theun 2 Power Company (NTPC), one of the nation’s largest economic development projects, spent over USD16.7 million to cover the cost of UXO-related operations in Nakai (Mine Action Canada, 2009). Another example is a large foreign mining company, Lane Xang Minerals Limited (LXML), based in Xepon, Savannakhet province, which has spent an average of USD3 million each year on the UXO operational activities (United Nations Development Programme, 2009). These circumstances indicate that a large
portion of funds intended to focus on the country’s economic development has to be spent on UXO operations, which reduces the capacity of the developmental efforts (Howe & Sims, 2011; Osterlind, 2008).

2.4.1.1. Land tenure issue

The problem of land tenure in Laos has long been identified (Baird & Billion, 2012; Friederichsen & Neef, 2010). Friederichsen and Neef (2010) point out that the land rights issues, including mappings in Lao rural areas, surfaced in the 1980s as the government did not put in enough effort to solve it. Most land cultivators in the country did not have official land tenure certificates and land ownership was dependent on village-based institutions, resulting in some major issues including the allocation of land to village collectives and the land titling extension (Baird & Shoemaker, 2007; McDowell et al., 2012; Vandergeest, 2003). In addition, the war and its consequences have altered the land use and tenure in dramatic directions, such as blocking access to cultivating land and restricting its development (Baird & Billion, 2012). According to Howe and Sims (2011), in many cases development expansion has forced people into UXO-contaminated land, which exposed them to more risk and caused problems in land tenure. In the case of Nakai, resettled villagers still encounter issues regarding individual agricultural land allocation and cultivating land inadequacy, which leads to food insecurity (Howe & Sims, 2011; McDowell et al., 2012; Schneider, 2014). The recent study by Phonepraseuth (2012) found that some villages complained that the land they were handed (0.66 hectare) with UXO cleared by Nam Theun 2 Power Company (NTPC) was too small to grow enough rice—their main source of food. The traditional shifting slash-and-burn agriculture was no longer allowed in the area and the NTPC livelihood project, including new agricultural methods, identified as sustainable, was put in place (McDowell et al., 2012; The World Bank & Asian Development Bank, 2010). However, the new irrigated agriculture has not yet been largely practised by villagers (McDowell et al., 2012).

Based on Robichaud (2013) claim that, although rain-based permanent paddy cultivation was practised by a minority of people, the soil on Nakai plateau is not suitable for permanent rice paddy development due to a cool and cloudy climate and insufficient level ground. This notion seems contradictory to the claim of local people as they said that they used to grow rice on a large piece of flat land and harvested a lot of rice, but when the NTPC came in and built the dam, their old land was flooded and they were given the 0.66 hectare of land as a compensation (Howe & Sims, 2011). McDowell et al. (2012) contend that prior to the
The resettlement, villagers could access more fertile land due to its close proximity to the Nam Theun river, which is different from the land quality in the current resettlement areas. To address this issue and other negative impacts, a resettlement package\textsuperscript{4} including a range of assistance was provided by the NTPC. The World Bank & Asian Development Bank (2011) maintain that this compensation was far beyond what the villagers had lost due to the dam project. A recent socio-economic survey in the resettlement area, as reported on the Nam Theun 2 Board Update Project Progress during 2011, showed that villagers have recently been living above the rural poverty line in Lao PDR (The World Bank & Asian Development Bank, 2011). However, the NTPC stated that the circumstances of resettlement remain challenging because villagers still need assistance to adapt to the new environment, to pursue opportunities and benefit from the advantages of the new livelihood system, and to cope with a changing socio-economic context (Nam Theun 2 Power Company, 2013b).

\subsection*{2.4.1.2. Scrap metal trade as a means of extra income and a driving cause of accidents}

Limitations to land use and economic conditions have forced people to search for income from other ways, including scrap metal collection and trading (Moyes, Lloyd, & McGrath, 2002; Wells-Dang, 2006). This means that to support their lives and families, people hunt for valuable pieces of UXO fragments which lead them directly to hazard (Marciel, 2010; McGrath, 2000). For instance, in a scrap yard examined by experts from the Mines Advisory Group (MAG) in Phonsavan, Xiengkhouang province, a live 3,000 pound bomb was found among several still-active items (McGrath, 2000). The demand for scrap metal has escalated since 2004 as a result of the increasing demand for steel in the construction industry at both national and regional levels (United Nations Development Programme, 2009). Consequently, the price of scrap metal has soared and the scrap metal collection has become a cash-driven activity that helped families to make money easily (Boddington & Chanthavongsa, 2010; Osterlind, 2008). This has brought all kinds of individuals, including children, to participate in such a fast cash business as it has become one of the few choices that helped contribute to the improvement of the families income other than their subsistence agricultural practices (United Nations Development Programme, 2009).

There are two main ways that UXO provides a source of income: “for the saleable value of the scrap metal and for the utility of the explosives” (Moyes et al., 2002, p. 36). Selling scrap

\footnote{Resettlement package includes community infrastructure (school, healthcare centre, water system, roads, etc.); Household infrastructure and assets (house, land, granary, etc.); livelihood programme (agricultural development programme, fishery programme, off-farm marketing, etc.); transitional support (monthly rice support, protein support, etc.) (Nam Theun 2 Power Company, 2013b; The World Bank & Asian Development Bank, 2011)}
metal, like UXO fragments and the explosive content inside the items, can enhance the financial circumstances of subsistence communities living in former conflict zones (Durham & Ali, 2008; Howe & Sims, 2011). In addition, some people attempt to turn the pieces of metal into equipment, such as knives and machetes, while others try to use the explosive contents for fishing purposes. Both methods bring about a good source of cash for individuals to support their families (Moyes et al., 2002). However, both practices indicate that people have had intrusive interaction with the UXO items (Moyes et al., 2002).

New road development has also paved the way for scrap metal dealers to wander into contaminated remoteness; development activities in poor nations mean there is more demand for metal, which makes scrap metal more valuable and stimulates residents to put more effort into looking for UXO fragments (Howe & Sims, 2011; Moyes et al., 2002; Wells-Dang, 2006). In addition, artificial metal detectors, which help scrap collectors to search for pieces of metal under the ground much easier, are sold cheaply (Ministry of Planning and Investment, 2006; Wells-Dang, 2006). Durham and Ali (2008) contend that some people surreptitiously watched UXO operation teams deal with UXO and tried to copy the strategy; then men, women, and children would use the local made artificial detectors to search for metal. This action, on the one hand, sounds like people have developed a strategy to cope with UXO danger. On the other hand, such a strategy has persuaded people to pay more attention to the scrap metal collection, which has led to a more complex issues in the effort to reduce the UXO risk (Durham & Ali, 2008). Although many people are aware of the danger, the need to support families has increased day by day (Howe & Sims, 2011). The study conducted by Moyes et al. (2002) suggests that the issue of scrap metal collection could be addressed. In Laos, some forms of regulation have outlawed the scrap metal trade and the practice has declined from its peak in the 1980s (Moyes et al., 2002). The expansion of UXO operations by both humanitarian and commercial operators are the major contributors to the decline of UXO metal collection (Boddington & Chanthavongsa, 2010).

According to the UXO Annual Report 2000, a number of accidents occurred and many of them came from the interaction with scrap metal dealing activity (Moyes et al., 2002; Osterlind, 2008). The report from the United Nations Development Programme (2009) also pointed out that the increasing number of UXO-related accidents recently may have resulted from the increase in the scrap metal industry as it encouraged people to collect UXO. In fact, based on the assertion of Durham and Ali (2008) and the assessment of Mines Advisory Group (2006), the causes of UXO-related accidents came from a range of activities
performed by those living in the contaminated areas. Durham and Ali (2008) further state that the mine risk assessment in five provinces in Laos, including Khammouane, showed that the most common ways that people are exposed to the risk of UXO is through dealing in the scrap metal business or collecting UXO fragments, moving UXO to cultivate land, and dismantling the live UXO item in order to sell the metal part and/or the explosive content. Although the assessment found that 82% of the respondents (1,312 people including adult men, women, and children) realised that no UXO was safe, about three quarters of them reported they routinely moving, burning, and collecting scrap metal.

### 2.4.1.3. Unexploded ordnance victim/survivor issues

The legacy of the war leaves a huge stain not only on socio-economic development, but also on the physical and psychological aspects of its victims (Mines Advisory Group & National Regulatory Authority, 2007; Osterlind, 2008). UXO presence is considered to be threatening the physical safety, livelihoods, and food security of people in more than 25% of villages in Laos (Howe & Sims, 2011; Norad, 2009). UXO accidents usually occur in remote mountainous areas where access to transportation is extremely poor, resulting in impossible access to healthcare for UXO victims (United Nations Development Programme, 2009). In addition, the limitation of the health facilities means that victims are often left bleeding to death as saline drips cannot be provided in time (United Nations Development Programme, 2009). Victims are unable to access treatment in the long-run and even those who have recovered from injury cannot perform work properly, resulting in being unable to support their families (Boddington & Chanthavongsa, 2010; Roberts & Littlejohn, 2005). Moreover, if the victim happens to be an adult or a family leader, the worst consequences are placed on the victim’s family in many ways (Osterlind, 2008; Roberts & Littlejohn, 2005; Wyper, 2012). Osterlind (2008) further suggests that, from an economic and human security perspective, the long-term consequences of an injury can even produce more damage to the family than the death of the victim. Likewise, Paterson et al. (2013) maintain that women carry a greater psychological burden as accidents usually happen to men who are their husbands and the family leaders, and children who are their sons or daughters.

The leading causes of disabilities in Laos may be congenital conditions, diseases, and road accidents (Lao Disabled People's Association, 2013), but the most severely disabled, who are in extreme need of assistance are the result of UXO accidents (Wyper, 2012). Lao Disabled People's Association (2013) points out that disabilities resulting from UXO incidents account for 10.2% of all disabilities. According to Cooperative Orthotic and Prosthetic Enterprise...
(COPE), the number of people whose disabilities were caused by UXO accidents and who have received its services accounts for approximately 30% of all the disabilities since the organisation was established in 1997 (Cooperative Orthotic and Prosthetic Enterprise, 2010). Many victims live in poor conditions and have limited opportunities to access education, health, employment, and proper housing (Wyper, 2012). Recently, the UXO survivor tracking system has been developed and it is expected that survivors will receive better assistance (National Regulatory Authority, 2013).

2.4.2. Correlation between UXO and poverty

Laos has been recognised by the UNDP as one of the world’s poorest countries with over one fourth of the population living in poverty, mostly in rural areas and heavily reliant on subsistence agriculture (International Labour Organisation, 2011; United Nations Development Programme, 2011). To address the poverty issue, the country is encountering a number of challenges, which are interconnected in many ways; thus, policies regarding integration, innovation, and coherence are strongly required in order to overcome these challenges (International Labour Organisation, 2011). One of the major challenges is the UXO problem, which has been threatening affected communities’ life prospects (National Regulatory Authority, 2011), and undermining the socio-economic development of the country for decades (Howe & Sims, 2011) even though the war ceased at the end of 1973 (United Nations Development Programme, 2009). UXO presence has made Laos’s achievement of most of its MDGs by 2015 elusive, and has slowed down the expectation that it aims to graduate from the LDC by 2020 (Government of the Lao PDR & The United Nations, 2013).

The presence of UXO prevents affected communities from accessing their arable land, undermines livelihood security, and hinders implementation of basic developmental needs, resulting overall in slow local economic growth (Baird & Billion, 2012; Howe & Sims, 2011; Özerdem & Roberts, 2012). The MDG Progress Report of 2008 stated that “high levels of poverty in rural communities often correlate with high levels of unexploded ordnance (UXO) contamination” (Government of the Lao PDR & The United Nations, 2009, p. 8). Severe UXO contamination in Laos normally occurs in remote areas where people practise subsistence agriculture and where most access roads to towns and the capital city are limited, resulting in difficulties for people in generating income (Khamvongsa & Russell, 2009; United Nations Development Programme, 2009). In addition, geographic conditions make the development-related operations elusive due to the diverse ethnicity of the population who
mainly live in mountainous areas and rely heavily on shifting cultivation (Friederichsen & Neef, 2010; United Nations Development Programme, 2007, 2011). The agricultural sector in Laos is the largest part of the national economy (Madhavi, 2008; United Nations Development Programme, 2009). The country’s labour market remains largely rural and agrarian, with agricultural and allied activities covering over 75% of the total employment (International Labour Organisation, 2011). Farmers account for about 70% of the population, 90% of whom practise subsistence agriculture, 72% of which is rain-based (Madhavi, 2008). However, UXO contamination has prevented fully accessing resources, public services, and market areas (Howe & Sims, 2011; United Nations Development Programme, 2009; United Nations Institute for Disarmament Research, 2007). Nevertheless, the necessity of living from day-to-day and the absence of choices mean that people have to cultivate the contaminated land, putting their lives at risk (Government of the Lao PDR & The United Nations, 2009; Moyes et al., 2002). Regarding this matter, McGrath (2000) maintains that if farm land is full of danger from UXO/landmines and farmers are unable to proceed with their job, agriculture activities cannot be implemented. In addition, the rapid growth of the population has also forced people to fight for land to cultivate, and that land is covered with live cluster munitions (Marciel, 2010).

Figure 7: Comparison between UXO contamination and poverty maps of Laos (Sisavath, 2006)

The limitations on land use and the increasing demand for reinforcing iron in construction businesses have forced people to look for bomb fragments and shrapnel to sell as a source of
income (Griffin et al., 2008). Moyes et al. (2002) argue that people’s attraction to UXO as a resource is driven by poverty, and poverty is caused by the conflicts that utilised ordnances, which did not detonate at the time and become UXO and in turn prevents people from growing cash crops as the land is too dangerous. Some families ignore the danger as they have no other options as they have to work to survive (Howe & Sims, 2011; Moyes et al., 2002; Roberts & Littlejohn, 2005). Wyper (2012) regards the situation in UXO affected communities as ‘enforced risk taking’ because people may have to live in acute poverty or in some cases chronic malnutrition unless they risk their lives working on the UXO contaminated land. As a result, they lose their family members to the UXO explosions or at least lose their limbs or other body parts and become burdens on the families (Wyper, 2012). The situation becomes worse if the families lose their leaders, for example, the fathers who are the main income earners (Osterlind, 2008; Wyper, 2012). Hence, the government regards the UXO threat as a major impediment to the poverty reduction effort (Norad, 2009).

2.4.3. An effort to reduce the slash-and-burn cultivation

Shifting slash-and-burn cultivation or upland rice growing has long been practised in Laos and it is regarded as the major cause of upland deforestation and degradation (Ducourtieux, Laffort, & Sacklokham, 2005; Roder, Phengchanh, & Maniphone, 1997). Most rural and remote communities in Laos perform subsistence rice farming as the practice has become the main source of food (Madhavi, 2008). Along with subsistence farming including the slash-and-burn practice, residents rely heavily on forest products and these have become important sources of food, income generation, and other kinds of material input to support their living conditions (Arnold & Perez, 1998; Jensen, 2009). Similarly, in Nakai plateau, upland shifting slash-and-burn cultivation along with hunting, livestock, and forest products play a major role in the livelihood of villagers (McDowell et al., 2012; Robichaud, 1995, 2013).

In its attempt to reduce the slash-and-burn practice, the Lao government, with the support of international agencies such as the World Bank, initiated the land allocation and land titling project in the 1990s (Ducourtieux et al., 2005). The land allocation policy is to protect the forest environment by encouraging village communities to manage farming areas in a more sustainable manner (Ducourtieux et al., 2005). However, the government’s attempt to end the slash-and-burn practice came up against a number of issues due to the ethical diversity and traditional practices as it involved resettlement from upland down to lowland areas (Baird & Shoemaker, 2007; Vandergeest, 2003). Even so, the government has managed to reduce the slash-and-burn cultivation from 118,900 hectares in 2001 to 29,400 hectares in 2005.
(Ministry of Planning and Investment, 2006). The policy also identified the importance of assisting village communities to avoid exposure to UXO threat by growing crops in the same pieces of land already cleared by UXO operators (Baird & Billion, 2012). However, shifting cultivation means people move from place to place in search of fertile land to grow rice and other kinds of crops (McGrath, 2000; Roder et al., 1997). This method puts their lives at risk as they may encounter areas full of UXOs (Boddington & Chanthavongsa, 2010). However, planting in the same piece of land and using rain-based methods reduces the quality of soil, resulting in a small amount of product generated which is insufficient to feed family members (Madhavi, 2008). Hence, agricultural land initiatives need to be developed so that the fertile land is sustainably used (Madhavi, 2008).

2.4.4. Contribution of the UXO operations to the community’s living conditions and safety

The creation of the national strategic plan plus an improved management system and better coordination has seen the UXO sector in Laos progress at a considerable pace (GICHD, 2014; Mine Action Canada, 2009). Meanwhile the United Nations Development Programme (2012) regarded the UXO operational tasks as a prerequisite to the development in the UXO contaminated areas. However, systematic assessment on the effectiveness of the UXO sector against its goals of contributing to the livelihood, socio-economic, and development conditions has not been adequately carried out (Durham, Tan, & White, 2011; GICHD, 2007). Durham et al. (2011) argue that the UXO sector is too focussed on land clearance and the number of UXO items disposed of, and not on the impact of the UXO operational intervention. Hence, to date, there has not been adequate evidence to demonstrate that UXO clearance contributes to the recovery of the post-conflict communities’ livelihoods (Durham et al., 2011). Nevertheless, UXO operations have been identified as contributing a great sense of safety to communities and providing safe access to agricultural land (Durham et al., 2005; Mines Advisory Group, 2006). A survey on the knowledge, attitudes, and behaviour (KAB) in relation to UXO, carried out in 2001 by Durham et al. (2005) after the UXO operational intervention, found that people had generally high levels of UXO awareness of the threat and safe and unsafe practices.

CARE Australia (2010) and Mines Advisory Group (2009) also claim that people in the communities where they worked have had better access to resources needed for to make a living; that is, they have more freedom to expand their rice fields and can grow other cash crops as a means of income generation. UXO clearance has enabled affected communities to
practise subsistence farming without fear; schools, local healthcare centres, and water points can be built which helps people to meet their basic needs (Mines Advisory Group, 2009, 2012a). The study by Durham et al. (2011), carried out in Khammouane province, found that the contribution of the UXO operations to livelihoods can be classified in five different ways; namely, natural, physical, human, financial, and social. In the sense of a natural way, communities can access land free of UXO; while in physical terms, community infrastructure can be improved and built including access roads, schools, healthcare, water, markets, and irrigation. In relation to the human dimension, this includes improved school attendance, an increased sense of pride, better access to food sources, a greater sense of safety, and more time to do other activities. Considering the financial situation, communities can produce cash income to buy fundamental food items; in the social context, people can participate more in social events and increase their ability to visit friends and neighbours outside their immediate community.

According to UXO LAO (2012), besides agricultural land clearance, the organisation also works in collaboration with the government’s development projects and INGOs to allow infrastructure establishment, such as school construction, irrigation systems, healthcare centres, road building, water supply projects, and other fundamental development activities. Likewise CARE Australia, since 2007, has worked with more than 2,500 families in the southern part of Laos to improve their living conditions by reducing UXO impacts. The programme consists of: providing risk education to villagers, including children; funding UXO surveys and clearance operations on cultivatable land; supporting people’s livelihood by enhancing their agricultural activities for rice farming and coffee plantation including animal raising; helping UXO victim survivors; and providing people with first-aid lessons (CARE Australia, 2013). Thus, UXO clearance RE are believed to provide affected communities opportunities to thrive (CARE Australia, 2010). It is argued that, although solely addressing the UXO problem may not directly help improve income or food security and accessibility to services, often UXO action is a prerequisite and a crucial multiplier for rural improvements and development in general (United Nations Development Programme, 2012). However, the UXO sector and developmental organisations still lack cooperation and partnerships, resulting in insufficient benefits received by the UXO-affected communities (McGrath, 2000; Roberts & Littlejohn, 2005).

Meanwhile, the UXO sector has made considerable progress in its operations although requirements cannot be met. In 2011, all UXO operators cleared 6,034 hectares and destroyed
186,987 pieces of UXO benefiting 587,230 people in terms of clearing agricultural land (National Regulatory Authority, 2012d). In the same year, the UXO/Mine risk education sector covered 3,384 schools and villages, benefiting 384,226 people of whom 297,519 were children and 86,707 adults. Between commencing operations in 1996 and the beginning of 2012, UXO operators cleared almost 32,000 hectares of contaminated areas including cultivating the land and initiating basic developmental projects (Latsaphao, 2013). In 2012 alone, all UXO operators in Laos cleared and disposed of 83,260 UXO items including 46,218 cluster sub-munitions; and managed to release a total of 6,060 hectares of land for both agricultural and developmental purposes—5,450 hectares were released through full clearance and 490 hectares through technical surveys (National Regulatory Authority, 2013). As a result, the number of UXO casualties has dramatically declined in the past four years from approximately 300 annually to 114 in 2010; 97 victims in 2011, and the number further dropped down to 56 in 2012 and 41 in 2013 (National Regulatory Authority, 2011, 2012d, 2013, 2014).

Even so it is unclear whether or not the remaining figure for the casualties comes from places where UXO operations have been undertaken. A study conducted by Phasavaeng (2011) in Sekong, Southern Laos, indicated that the number of casualties remained high in the first four years of UXO operations. Then after year four, the number of casualties dramatically declined. The author further points out that this could be because more and more contaminated land was cleared and so people had safe land to live on (Phasavaeng, 2011). However, the study does not show whether those casualties came from the areas where UXO operations had been carried out. In the case of Afghanistan, based on the Mine Action Coordination Centre for Afghanistan (MACCA), the data shows that there were no UXO/mine casualties happening in the community after the clearance operations (Paterson et al., 2013). In addition, the post-clearance assessment conducted by MAG found that 94% of its respondents felt great safety for their family (Mines Advisory Group, 2006). Most community members in the MACCA’s survey area also reported great confidence in working on the land after the clearance, and the land cleared was also quickly utilised for different purposes (Paterson et al., 2013).

RE, initiated in 1994 by UXO Lao and the World Education Consortium (WEC), has played a crucial role in the UXO casualty reduction effort (Mine Action Canada, 2009). Recently, the NRA’s RE unit also worked with UNICEF and other educational organisations in order to better access vulnerable groups i.e. children (Boddington & Chanthavongsa, 2010). Hence,
Boddington and Chanthavongs (2010) suggest that educators work closely with parents and community leaders to take responsibility for the process. Likewise, the UXO victim assistance coordination has improved since the NRA established its victim assistance unit, and a pilot project called ‘UXO Survivor Tracking System’ has been launched to track down survivors and monitor service provision (it is now in the process of data entry) (Boddington & Chanthavongs, 2010). In addition, services for UXO incident emergency and physical rehabilitation have also become more accessible, although it is still highly inadequate to meet the requirements of over 7,000 survivors. (GICHD, 2014; National Regulatory Authority, 2013).

Recently, humanitarian UXO operators have been focusing on clearing priority/high value land and related tasks (GICHD, 2007, 2014). These include agricultural tasks: roving activity; public service utilities such as medical/public health centres; water points; and educational utilities (GICHD, 2014). The operators also include RE, VA, and advocacy activities in their priorities (United Nations Development Programme, 2012). Currently, the UXO sector has the capacity to clear approximately 5,000 hectares annually on average. Yet, UXO operations are still considered slow-moving and cannot release sufficient cleared land for the increasing population and for development (Roberts & Littlejohn, 2005). Thus, if the identified high priority areas (200,000 hectares approximately) have to be cleared by the year 2020, around 20,000 hectares have to be completed each year and USD30 million will be required (Latsaphao, 2013; National Regulatory Authority, 2012d). However, since this notion seems impossible, another approach - RE - has become an essential option to help reduce levels of UXO danger and change people’s attitudes against UXO (Durham & Ali, 2008; Durham et al., 2005). Yet, RE still needs to be improved in terms of the information dissemination because in many UXO-contaminated places, not all individuals at risk have participated in the sessions (Mines Advisory Group & National Regulatory Authority, 2007). For instance, according to Paterson et al. (2013), the survey carried out by MACCA indicated that the coverage of RE in the area is far from universal because not all children and women have attended the sessions as many of them have restricted mobility.

### 2.5. Conclusion

Unexploded ordnances still remain as one of the many challenges to the development of Laos, particularly to the agricultural sector and the well-being and safety of those living in

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5 Roving activity refers to the UXO removal/disposal task carried out in a place where there is UXO found on the ground surface; usually the UXO found is on the current land use and is reported to the UXO team by villagers (Boddington & Chanthavongs, 2010).
remote contaminated areas. The UXO presence not only generates negative impacts on people’s lives, but also prevents affected communities from fully accessing agricultural land, restricts fundamental development projects, and impedes socio-economic prospects for the country in general. Recently, although concerned organisations have made an effort to tackle the issues, the contamination is too severe and too large to be covered. In addition, UXO operations, particularly the clearance, are delicate tasks that require specialised skills and technical experience. Stenstrom, Westrin, and Ritchey (2004) state that “UXO clearance is both expensive and time consuming” (p. 3). This suggests that to provide safety and to expand development opportunities, Laos still requires technical, financial, and co-operative assistance from international bodies. In addition, it has long been recognised that the poverty issue is correlated with a high level of UXO contamination (Government of the Lao PDR & The United Nations, 2009). Hence, tackling UXO problems and raising awareness for people against UXO danger should contribute to poverty alleviation.

Laos is determined to mitigate the UXO impacts, although it is impossible to get rid of every single item of the ordnances in the foreseeable future. So far Laos has made substantial progress by clearing over 5,000 hectares of the contaminated land annually (National Regulatory Authority, 2012d), and the figure seems to have slightly increased in the past few years. Risk education programmes have also reached a large number of UXO-affected communities, resulting in a considerable decline in the number of UXO casualties. Furthermore, agricultural land is safe and can be expanded, which means subsistence farmers have had safe land to grow crops to feed themselves and even to sell in local markets. Development projects that link remote areas to towns are growing fast once they are free from UXO danger. McGrath (2000) and Roberts and Littlejohn (2005) suggest that more assistance from, and partnership between the UXO sector and other organisations focusing on development are required in order to maximise benefits of the UXO-affected communities.

Generally, the literature demonstrates how the world reacts to UXO/mine problems ranging from local to national, regional, and international levels. It also shows how the war legacy threatens life, restricts access to land, hinders basic developmental systems, and undermines the socio-economic position of the countries affected. In addition, the literature points out how UXO/mine clearance and risk education are valuable to the UXO-affected communities. However, the literature also indicates that the UXO post-clearance assessment in relation to community well-being has not been adequately carried out.
CHAPTER THREE

RESEARCH METHODOLOGY

INTRODUCTION

Chapter two explored the literature from a variety of sources concerning a range of viewpoints about the UXO/mine issues. This chapter addresses the methodological approach and methods employed in this research study. It begins with a general definition of methodology, a discussion of the paradigm, the qualitative approach and why this method is appropriate to this research. Next, the method of data collection—the semi-structured interview—and its role are discussed in detail. Then, the participant recruitment process is explained, as is the analysis of the data through the thematic strategy. Finally, the chapter addresses the ethical issues involved in this research study.

Nakai is located in the middle part of the country, which is about 450 km from the capital city of Laos. To travel to the area, the researcher had to take a bus south to Thakhek, a capital city of Khammouane province, which took approximately seven hours. A night stay had to be made in Thakhek because by the time I arrived, the last transport to Nakai had left. I had to get up at 7:00 AM the next day in order to catch a two-row truck, where people sit facing each other, from Thakhek to Nakai, and this took two and a half hours for a distance of 95 km. The road condition was not bad, but the truck had to stop along the way to pick up more passengers and for some to get off. As soon as I got to Nakai, I asked around if there was any guesthouse to stay in. I was told there were two guesthouses, both of which were nearly two kilometres away from the town centre. I had to walk there carrying my belongings because there was no public transport in such a remote area. I finally found a place to stay, which was comfortable because electricity, running water, and a bathroom were all available. However, I had to walk on average of 10 kilometres per day both to and from the town centre and the target village.
3.1. Research methodology

This research study is based on qualitative methodology, which Creswell (2012) and Denzin and Lincoln (2005) maintain allows researchers to understand the world in which people work and live through researchers’ interpretations and assumptions based on interactions they have with individuals. Furthermore, this study is based on field work carried out over a period of nearly a month from 12 June – 9 July 2014. The study took place in one of the villages in Nakai Plateau, one of the most heavily bombed districts of Khammouane province. The research was solely conducted by the researcher as part of his study to fulfil the Master’s degree in Social Practice. The researcher employed a qualitative approach and used the semi-structured interview as the primary data collection method. Then, the findings of the research were triangulated with the existing literature described in Chapter Two. Prior to the start of the research, a research proposal was submitted to the UXO/mine sector in Laos (the NRA) in order to obtain written official permission. In addition, the Nakai District Administration Office was informed and another written document was issued for the convenience of the researcher and to gain support of the village where this research took place.

3.2. Research paradigm

Neuman (2003) defines a paradigm as a primary orientation to research and theory. A research paradigm works as a set of basic beliefs and assumptions that underpin researchers’ understanding of world phenomena (Collis & Hussey, 2009). It is the belief that affects the process of social research study, particularly when selecting a research methodology (Braun & Clarke, 2013). In this sense, based on the researcher’s experience working in this area, as well as in other locations throughout Laos, UXO and communities’ livelihoods were correlated. UXO affected people’s lifestyles including their daily activities. The extent of such a correlation has been pointed out by a number of organisations working in the field of UXO operations, but the effectiveness of such operations on the community’s livelihoods has not been sufficiently carried out. This issue has triggered my belief that a qualitative study of the relationship between the community and the UXO, as well as the community’s living conditions will deepen my understanding and clarify how much UXO operations, including the RE, have facilitated the community’s well-being and safety.

Van Maanen, 1983 as cited in Collis and Hussey (2009) contends that the main focus of an interpretive paradigm is to explore the complexity of social phenomena with the intention to obtain interpretive understanding while adopting varying methods in order to seek to translate
and describe what exists in the social world and turn it into meaningful terms. In the interpretive paradigm, reality and knowledge are reproduced and created through practice, interaction, and communication (Tracy, 2012). Creswell (1994) asserts that it is impossible to separate the researcher from that being researched because they interact and what is in the researcher’s mind is bound to what exists in the social world. In this sense, the interactions with the research respondents through the pre-meetings and the interviews, as well as observations of village surroundings, enabled the researcher to find numerous features that linked to the research focus. These included: the actual work site as the researcher went to the rice field and garden with some of the respondents in order to see the UXO issues they claimed; informal discussions with some villagers over dinner; and taking several photos of grazing cattle and other agricultural features. Together, all these features helped the researcher to better understand the social phenomena of the research location. Collis and Hussey (2009) assert that interpretive research is of a kind where information collected and the findings are not extracted from statistical analysis; instead, they are derived through interactions and interpretations of what exists in the social world. The interpretive paradigm allows the researcher to interpret the information collected and transform it into findings based on the participants’ perceptions, feelings, and experiences (Creswell, 1994; Denzin & Lincoln, 2005; Tracy, 2013). In this respect, the researcher triangulated the photos he took and daily activities of the villagers he observed into the data presentation. This can be seen in a number of photos attached in Chapter Four as they indicate changes in the village after the introduction of UXO operations.

Based on the understandings of Denzin and Lincoln (2005), Saunders, Lewis, and Thornhill (2009), and Wahyuni (2012), research paradigms can be divided into four different types: positivism, post positivism, interpretivism, and pragmatism. The researcher applied the interpretive approach in the study as it is relevant to the methods and the nature of this research study. This means that the researcher interpreted the information given by the research participants based on their perceptions, feelings, and the researcher’s experience working in this field. Based on the perspectives of Braun and Clarke (2013), Ritchie and Lewis (2003), and Saunders et al. (2009), the on-going construction of reality’s existence is contributed to by individuals’ varied backgrounds, experiences, and assumptions through interactions within the broader society context. Researchers prefer to interact and have conversations with research participants in order to understand the social world through their subjective meanings and experiences (Creswell, 2009; Wahyuni, 2012). In this study, the researcher came across a number of intangible phenomena stemming from his interactions
with the research participants and his own observations in relation to the UXO issues. As a result, the researcher has gained sufficient information needed for the data analysis. Hesse-Biber and Leavy (2011) maintain that interpretivist researchers also favour dealing with qualitative data. This form of research also offers rich information of social constructs due to its natural setting (Bryman, 2008, 2012; Denzin & Lincoln, 2005).

### 3.3. Research methods

#### 3.3.1. Qualitative approach

Qualitative research methods in conjunction with the interpretive paradigm are used in this research project. Denzin and Lincoln (2005) define qualitative research as “a situated activity that locates the observer in the world and that researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (p. 3). In this study, the researcher went to meet participants in their homes, and sometimes in their workplaces, such as gardens and rice fields, to observe situations related to the research focus. Qualitative study is research which places the emphasis on words rather than numbers or statistics in data collection and analysis (Bryman, 2012; Creswell, 2009; Ritchie & Lewis, 2003). The qualitative approach is “a form of interpretive inquiry in which researchers make an interpretation of what they see, hear, and understand” (Creswell, 2009, p. 176). For example, the researcher triangulated what he saw and heard with the information gained from the respondents. This further validated the data gathered. Coleman and Briggs (2002) contend that qualitative research focuses on the process and meaning that lie behind numerous behaviour patterns which are not measured in intensity, quantity or frequency; it is in the form of words used to offer meaning to personal experience and not numbers. Qualitative research is a form of social investigation focusing on how individuals make sense of the world they live in, including their experiences (Holloway & Wheeler, 2013). Braun and Clarke (2013) and Liamputtong (2013) propose that the aim of qualitative research is to examine the meanings or a process that individuals give to situations in their own society. In this respect, this study was designed to obtain the perceptions of people in the UXO-affected community where UXO operations have been already carried out. The study intended to find out how the operations have impacted individuals’ well-being, including safety and living conditions, through the lens of individuals by comparing the present circumstances to those prior to the introduction of the UXO operations. Based on Merriam (2014) understanding, the key concern of qualitative research is to understand phenomenon of interest emerging from participants’ points of view and not the researcher’s;
and it is sometimes referred to in terms of emic perspectives versus etic perspectives. For example, as a researcher, my responsibility was to ask questions and clarify answers given by the respondents. The researcher did not act as a leader in the conversations in order to avoid bias.

Tracy (2013) explains that the qualitative method “is an umbrella concept that covers interviews (group or one-on-one), participant observation (in person or online), and document analysis (paper or electronic)” (p. 28). According to the summary adapted from Holloway and Wheeler (2013) and Robson (2011), although qualitative approaches differ in their methods of data collection and analysis, they tend to use similar procedures and share common characteristics. The main features of qualitative research include most of the following elements:

- It is context-bound -researchers have to be sensitive to context. To do so, this researcher always tried to search for meanings that lie behind the cluster of information obtained.
- Researchers cannot be separated from the natural setting of individuals whose experiences, behaviours, and perspectives they intend to study. This is because a qualitative study is designed to gain in-depth understandings that emerge from the respondents. In this study, the researcher did not simply come up with theory without evidence from the respondents and the researcher’s observations.
- Qualitative researchers focus on the emic perspective, perceptions and the views of the research respondents, as well as interpretations and meanings. In this regard, the researcher did not influence participants, but acted as a guide. The information obtained is generated through the lens of the participants.
- Qualitative researchers do not only interpret, describe, and analyse; but also dig deep beyond the natural setting of the respondents. For example, the researcher observed the surroundings to find out what might reflect the research focus such as going to see some of the respondents’ paddy fields and gardens.
- The researcher is the main research tool whose explicit stance is constituted by reflexivity in the research. This means that the researcher in this study came up with all the procedures as well as acting as a guide while the participants generated the information needed to complete the research.

While quantitative research values objectivity, in the same way, qualitative research values subjectivity (Braun & Clarke, 2006). This means that theory is constructed through the
information gained from the research participants. In a qualitative approach, researchers might have inadvertently influenced the research results (bias) and avoidance is a major concern (Braun & Clarke, 2013). For this study, the researcher acted as a follower, letting the research respondents take the lead in the conversations, and tried to clarify and dig deeper into the answers given. Braun and Clarke (2013) state that, in a qualitative process, research respondents bring their own experiences, values, and perspectives to the research; while researchers bring forward their assumptions, values, and mannerisms to the research. In this study, the semi-structured interviews assisted the researcher to gain an in-depth understanding of the perspectives, experiences, and values of the participants in relation to the issues of UXO and the consequences of the UXO operations. As such, the researcher was able to make assumptions based on the information obtained and the statements mentioned in the literature.

Although a qualitative approach fits this study, the approach does have some weaknesses. It is time-consuming due to the complexity of its nature (Bryman, 2004) and it serves as a metaphor for truth, power, and knowledge (Denzin & Lincoln, 2005). The process also involves interpretation and observation of the participants' behaviours, and then assumptions are made which can possibly result in inaccuracy of the information obtained known as ‘bias’ (Collis & Hussey, 2009). Thus, a researcher is required to stay focused while conducting qualitative research. In this regard, the researcher often asked the interviewees sub-questions around an issue. At the same time, the researcher observed the reactions of the interviewees to find out whether or not they were confident while answering. If the interviewees looked hesitant, the researcher tried to assist by providing options in order to get to the initial point.

3.3.2. The essence of the qualitative methods for this study

There are a number of reasons why qualitative methods fit this research study. According to Miles and Huberman as cited in Punch (2005), qualitative research is carried out through a deep contact with life situations that reflect the day-to-day lives of individuals, while the role of the researcher is to obtain a holistic view that lies in the context of the study. In this sense, the researcher carried out the study through close contact with the respondents. One or two days before each interview, the researcher met with the potential participant in order to explain to him/her the purpose of the research. The researcher also had conversations with him/her about other stories not related to the research in order to create a friendly atmosphere prior to the actual interview. Furthermore, the researcher wandered around the village every day to observe and take photos of the surroundings. As a result, the researcher was able to
gain insights into the life experiences of villagers as a consequence of the completion of UXO clearance and RE activities. Babbie (2007) contends that one of the advantages of qualitative research is its flexibility. By applying this method in conjunction with the semi-structured interview, the participants were able to portray their life stories concerning UXO problems and how the UXO operational intervention has made changes to their well-being and safety, including the socio-economic and developmental status of the village.

The qualitative method is strongly claimed by several authors as an approach designed to gain an in-depth understanding of the social construct. In this sense, well-being is a broad and controversial term; therefore, a qualitative approach is suitable for this study. Punch (2005) says that a qualitative approach acts like an umbrella term that embraces significant diversity. In the study conducted by Camfield, Crivello, and Woodhead (2009), it is proposed that qualitative approaches encompass an essential measurement that assists both researchers and participants themselves to better understand what is meant by well-being. In addition, the findings of the study emphasise that qualitative approaches have an additional role in investigating the subjective well-being of individuals and the holistic and contextual meanings underneath their social circumstances (Camfield et al., 2009). In this regard, due to the friendly nature of the villagers, as well as of Lao countryside communities in general, plus the familiarisation of the researcher with the location, getting into a deep relationship with the potential participants was not that difficult.

Traditionally, in the remote corners of Laos, people, particularly the women, do not talk much when prompted by outsiders. This was the case in the area where this research was carried out. However, due to the researcher’s experience working with people in the area, including the research village for some years, an appropriate way to approach them in a friendly manner emerged. For example, when wanting to meet shy villagers, the researcher smiled and introduced himself rather than immediately asking them questions. This way, the villagers felt much more confident about talking. In addition, the qualitative approach with the semi-structured interview enabled the researcher to amicably guide and encourage the participants to relate their stories and experiences. As stated by May (2010), the semi-structured interview allows the researcher to clarify and elaborate further from the answers given and it gives the interviewer more latitude to further engage in dialogue with the interviewees and be able to probe beyond what is already spoken. This means that if an interviewee struggles to explain or give answers, the researcher can give direction by
inserting some clarifications and options. For example, the researcher tried to paraphrase the questions in different ways until the respondents clearly understood the point.

Qualitative research is subjective, which means researchers get involved in the social world of what is being examined (Bryman, 2012; Ritchie & Lewis, 2003). Subjectivity is the quality of processing perceptions, experiences, beliefs, feelings, desires, and/or power which are used to explain what informs and influences individuals’ judgements about reality or truth (Beiser, 2002). This is in line with Braun and Clarke (2013) who say the qualitative approach deals with subjective information that is derived from the research participants’ feelings, beliefs, experiences, and opinions. In this regard, participants’ perspectives and experiences about UXO operations were drawn out and a number of implications can be further discussed in the findings and discussions.

Qualitative approaches also help researchers to better understand individuals’ perspectives and life experiences from which translations and findings can be drawn (Bryman, 2004). This approach allows the researcher and individuals being investigated to have close involvement, which means that the researcher genuinely understands the world through the views of those being studied (Bryman, 2008; Creswell, 2012; Liamputtong, 2013). On this point, the previous experience working in the area helped the researcher to become familiar with how the community views the world. Hence, the qualitative approach is crucial when complex issues need to be understood in greater detail (Liamputtong, 2013). According to Creswell (2012), such detail can only be perceived by directly talking to individuals, meeting them at their homes or workplaces, and letting them relate the stories without interrupting them with what the researchers expect to find or what is said in the literature. In this study, the researcher mostly met participants at home, usually at midday because villagers returned home for lunch if their workplaces are close to the village. In one case, the researcher had to follow the participant to his garden in the rain to further talk to him about his agricultural activity. This indicated that this particular participant was really busy as he continued to work even though it was raining. In another case, the researcher had to signal to the participant when the matter went off track by trying to insert a new question. At the same time the researcher took note of the point and talked further to the participant about the topic when the official interview was completed. The conversation sometimes lasted for over an hour and this was one of the many ways that helped the researcher understand the views of participants in more depth.
Last but not least, qualitative research produces a richness of data due to the close participation of the researcher with the people being investigated (Bryman, 2008). Qualitative data are “well grounded and provide ‘thick’ and rich descriptions and explanations of processes situated within particular contexts” (Miles & Huberman, 1994). Similarly, Gray (2014) comments that the qualitative approach is highly contextual; hence, it can show how and why things occur and so goes beyond offering a mere snapshot. To ensure the close participation between the respondents and the researcher, the researcher took the opportunity provided by the research participants to look at some of the agricultural activities happening in some of the UXO cleared areas. In fact, the researcher wandered around nearly every day after the completion of each interview in order to observe activities and features that might relate to the research focus. Sometimes the researcher saw villagers carrying bush mushroom and fish and walking towards the local market and very often they asked if the researcher wanted to buy from them. This implied that villagers are confident to go into the jungle to find bush products, and that they also can access more food sources such as through catching fish. This also means that villagers not only find enough food for eating, but also for selling to earn extra income.

3.4. Methods of data collection and analysis

3.4.1. Research sampling

The participant selection strategy of this study was based on quota sampling. Quota sampling aims to proportionally reflect the population with diverse categories including age, gender, and socio-economic groups (Bryman, 2012). Denscombe (2007) explains that, like stratified sampling, the representation of all essential categories is in proportion to their number in the wider population. To this notion, Abbott and McKinney (2013) and Babbie (2008) add that this sample method is based on a matrix that defines certain features of a target population and quota matrices fit in the proportion of demographic characteristics. Quota sampling ensures that the range of diverse groups of residents are included (Braun & Clarke, 2013). In this study, the population in the research village comprises mainly subsistence farmers/gardeners. There are also some local government officers including police, military personnel, teachers, and river fishermen. Hence, farmers/gardeners make up most of the participants for this study. Babbie (2008) maintains that this sampling approach addresses the issue associated with representativeness. This study’s sample also took into account the gender and age group of the participants in order to seek a wide range of perspectives concerning UXO issues. Sandelowski (1995) says that this approach sometimes includes
demographic patterns, such as sex and age, or phenomenal structures, such as types of experience. The criteria in quota sampling allows researchers to focus on participants whose experiences, knowledge, and insights might best fit the research topic (Braun & Clarke, 2013). This study chose to employ more subsistence farmers as its respondents due to the fact that the majority of the villagers practise farming as their core occupation, the one on which they rely. Moreover, farmers are those who have been directly affected by the UXO problems.

The sample size in qualitative research is usually smaller than that of quantitative research. It varies and is dependent on the research design, its purposes, and the availability of resources, including time (Braun & Clarke, 2013). Patton (2002) asserts that “there are no rules for sample size in qualitative inquiry” (p. 244). While quantitative sampling has the aim of generalisation to a wider population, qualitative sampling is purposive and it aims to generate in-depth understanding and insight (Patton, 2002 as cited in Braun & Clarke, 2013). In this respect, this research aims to gain in-depth understanding about the livelihood circumstances of the respondents as a result of the UXO operations.

3.4.2. Participant recruitment strategy

Eleven participants were recruited and drawn from the core occupations existing in the village in Nakai. The participant selection process was arranged through cooperation with the village chief. This was not only because it was culturally appropriate and polite, but also because his acknowledgement of the research would be, in general, a requirement for participation. That is, the research may not have happened without his support, permission, and thus the support of the villagers. After receiving general information from the village chief in terms of villagers’ occupations and general activities, including the list of villagers’ names, the researcher wandered around to greet some people who stayed at home that day. The researcher also explained to them the purposes and objectives of the study. Some of them seemed to be very curious while others did not seem to have any interest. Then the researcher said that he would come to talk further to them over the following days.

The researcher managed to hand out the information sheet to a total of 15 villagers who said they were interested in taking part in the study. Later on it was revealed that all of them could read, but some did not want not read. Hence, the researcher read and explained to them what they had to do if they were curious about taking part in the study. The day before the interview schedule, the researcher went into the village in order to get their confirmation as to
whether or not they would like to take part in the study. The researcher found it quite difficult as many of them left home early in the morning and returned home late. Although 15 people were initially curious about the study, when the actual interviews started, four of them were never at home when the researcher showed up in the village. As a result, only 11 participants were included in this study.

Approximately, half the population in Nakai is under 30, so participants were selected from two different age groups: one under 30 years of age and another over 30. In this research, six farmers were chosen as participants (three males and three females), all of whom are older people. The other five participants were selected from other occupations available in the village. This way, information regarding UXO issues and how people think about the impact of UXO operations could be varied as samples chosen would probably have different experiences of the situation. The details of participants selected are shown in the table below.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Over 30s</td>
<td>Under 30s</td>
<td>Over 30s</td>
</tr>
<tr>
<td>Farmer</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Teacher</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Trader</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Military personnel</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Village chief</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>River fisherman</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

### 3.4.3. Participants

Originally, 12 participants were expected to be included in this research study, with equal numbers of males and females and from the two age groups (over 30s and under 30s). However, only 11 participants could be chosen due a number of reasons. First, most of the young people have left home to work and study in cities and only very few presented in the village at the time of this research. Second, according to the village chief, villagers are hardly ever at home during the day as they normally go to work in the rice fields or to the jungle to find food, while some go to work for Nam Theun 2 Power Company as construction workers. Some people go fishing and stay away for two or three days before returning home.
normally go out around 6:00 in the morning and return home around 5:00 or 6:00 in the evening. Because of this, it was hard for the researcher to meet with them. Going to see them in the evening was an option, but it was not really possible as where the researcher stayed, which was the only place available, was quite far away from the village and no vehicle was available for rent at the time. Some villagers claimed that walking to and from the village at night time could put me at risk of robbery because of illegal drug involvement in the area. Third, the researcher had to choose more males than females because most females were relatively shy and did not speak much. This could be seen through the conversations the researcher attempted to make with them prior to the start of the actual study. However, eleven out of the fifteen possible participants who received the information sheet and originally agreed to participate in the study were happy to provide their stories regarding UXO issues, while the other four could not participate as they were always away when the researcher was in the village.

3.4.4. Semi-structured interview

This research project employed semi-structured interviews for the primary data collection. A semi-structured interview is a qualitative data collection approach designed to gather information about interviewees’ perspectives, opinions, ideas, and experiences; and it is particularly useful because it allows interviewees to relate their stories in their own words and follow their own perspectives on the key point within the research topic (Arksey & Knight, 1999). This meant that the research participants of this study could describe situations before and after UXO operations, which offered the researcher insights into the general background of the research arena. Galletta (2013) contends that the semi-structured interview is valued because its use of questions, prompts, tools, and resources allow the researcher to reflect variation and persuade participants to engage more fully in the research study. The semi-structured interview enables the interviewer to seek clarification and elaboration beyond original answers provided by the interviewees (May, 2010). For example, this study’s participants often referred to several aspects in response to each main question, which convinced the researcher to ask for more explanations relating to those points.

Bryman (2004) and Denscombe (2007) contend that, in the semi-structured interview, the interviewer has a set of fairly specific questions known as the interview guide, but the interviewee usually has freedom to give answers within the scope of the overall research topic. This means that questions not on the list may be asked if the interviewer picks up points relating to the topic proposed. In this respect, the researcher asked a number of sub-
questions and this made the interview more informative. The interview guide acts as a checklist of issues to be explored, while order and wording for the questions are often adjusted based on the interview flow. In this way, unplanned questions emerge which the researcher uses to follow up points mentioned by the interviewee (Robson, 2011). Barbour (2014) suggests that leaving some room for the interviewee to express his or her own reflections and insights is the key to the semi-structured interview. Flick (2006) states that the nature of the semi-structured interview makes it possible for research questions to be created through maintaining flexibility in the conversations. In this case, a small number of broad questions around participants’ well-being and safety in relation to UXO clearance and risk education were prepared by the researcher. By utilising the interview guide plus a range of related sub-questions, the interviewees were encouraged to tell their stories. To ensure adequate information was generated, a series of prompts were designed to cover specific issues relating to the research topic and which could then be used when these did not arise in the course of the interview. These topics then automatically became themes in the data analysis. (See the interview guide containing potential themes in Appendix 1).

The interviews were conducted in the Lao language as all the participants were Lao nationals. Interviews were audio recorded to ensure that essential information that could be helpful for the data analysis stage was not missed. Each interview was divided into three stages following the Davidson and Tolich (2003) approach and took approximately 30-45 minutes. The first 15-20 minutes covered participants’ general descriptions or story of their living conditions and safety issues in connection to the circumstances before and after the UXO operations. This part was mostly descriptive as the interviewee took a leading role while the researcher occasionally inserted related sub-questions in order to encourage the participant to portray a full picture. This included all the proposed topics mentioned in the interview guide. The next 10-15 minutes allowed the researcher to clarify and evaluate just how effective UXO clearance and risk education have been from the perspective of the interviewee based on his/her real life practices such as perceived well-being including safety and livelihood. The final five-10 minutes covered possible solutions and recommendations that the informant thought should further happen in the village and in other UXO contaminated areas. Finally, the researcher asked the participant to provide some demographic information as this could be useful for the data analysis and the discussion of findings. The information included age of the participant, gender, and occupation.
3.5. Data analysis

There are a variety of strategies and procedures in qualitative data analysis (Creswell, 2009; Liamputtong, 2013). Lofland, Snow, Anderson, and Lofland (2006) define data analysis as the process of transforming raw data into findings or results. Similarly, Neuman (2003) refers to the process as “examining, sorting, categorizing, evaluating, comparing, synthesizing, and contemplating the coded data as well as reviewing the raw and recorded data” (p. 448). In addition, Davidson and Tolich (2003) explain that “analysis is about searching for patterns and regularities in the data collected” (p. 154). Qualitative analysis associates the use of generalised themes to identify the relationships between elements of a data set (Marshall and Rossman as cited in Gibson & Brown, 2009). The nature of qualitative analysis is interpretative, since it aims to go beyond descriptive analysis as it attempts to obtain a deeper perception of the data collected; it looks underneath the data surface by trying to understand how and why, and providing concepts and theories around accounts generated from the data (Braun & Clarke, 2013). This theory is supported by Gibbs (2002) who contends that interpretive philosophy is the framework on which qualitative analysis tends to be based. Researchers tend to focus on a holistic view of what they are attempting to explore in order to understand the social world and seek for meaning that resides in it. Neuman (2012) claims that because qualitative data are in the form of words and phrases that represent or describe individuals, events, and actions in the social world, the analysis is not based on a statistical system. Nevertheless, qualitative data analysis is not vague but rigorous and systematic in its own way; it is relatively dynamic, iterative, and recursive and “usually seeks to enhance the data, to increase their bulk, density and complexity” (Gibbs, 2002, p. 3). Barbour (2014) argues that thinking ahead and being systematic are the keys to effective qualitative research so that researchers can avoid challenges to the analysis. Qualitative analysis is dealing with words, such that “the words can be assembled, sub-clustered, broken into semiotic segments. They can be organised to permit the researcher to contrast, compare, analyse, and bestow patterns upon them” (Miles and Huberman as cited in Punch, 2005, p. 142). Davidson and Tolich (2003) maintain that one of the strengths of qualitative analysis is its flexibility.

3.5.1. Thematic analysis

The thematic analysis approach is used to analyse the qualitative data of this research study. In qualitative research, thematic analysis has become the most common form used for data analysis. Thematic analysis is relatively distinctive among other analytic strategies in qualitative research as it provides only the method for data analysis and does not prescribe
data gathering methods, theoretical stances, ontological or epistemological frameworks (Braun & Clarke, 2013). One of the major strengths of the thematic analysis is flexibility as it can be utilised to give answers to most of the research question types and to analyse most kinds of data. Thematic analysis emphasises examining, pinpointing, and recording patterns known as ‘themes’ within data (Braun & Clarke, 2006). The process of theme identification is done through “careful reading and re-reading of the data” (Rice & Ezzy, 1999 as cited in Fereday & Muir-Cochrane, 2006, p. 4). Fereday and Muir-Cochrane (2006) conclude that thematic analysis is how the form of a pattern is recognised within the data such that arising themes can in turn be deployed as categories for analysis. In this study, the themes were defined through the interview guide, clusters of information obtained, statements and actions made by interviewees, and the repetitions in the data noted. These characteristics were then coded and placed in the table prepared as shown in Table 5 on page 60.

According to Gibson and Brown (2009), the concept of thematic analysis consists of three sets of aims: to identify commonalities, to find out differences, and to examine relationships in a data set. Commonality identification involves looking for ways to group together similarities from across a data set which can be categorised. Finding out differences involves searching for distinctive features in a data set including comparing, contrasting, and identifying potential relevance. Relationship examination involves the ways in which diverse code categories connect to one another or how differences or particular individual characteristics relate to themes. To better identify themes, the coding process was used in this study’s data analysis by dividing into seven phases adapted from the literature (Braun & Clarke, 2006, 2013; Robson, 2011). These include: transcription; familiarisation of data; initial coding; searching for themes; reviewing themes and looking for sub themes; defining and naming themes; and finalising the analysis.

(a) Transcription: After data collection is completed, transcribing into written form is essential (Braun & Clarke, 2013). In this study, transcription was performed right after the interview was over or later on the same day. This is because the researcher wanted to ensure that wordings which could potentially become themes were still fresh in the researcher’s memory.

(b) Familiarisation of data: The initial stage in the thematic analysis is that the researcher is required to be familiar with the data collected (Braun & Clarke, 2006, 2013). To do so, the researcher read the transcripts over again and again until the data was comfortably familiarised. At this stage, notes taken during the interview were also taken into account and
information contained was integrated into the identification of potential codes. Notes were only written down right after the interview, the notes reaffirmed the codes.

(c) Initial coding: Marking data that offer answers to the research question is the initial step in the coding process (Guest, MacQueen, & Namey, 2012). This includes creating a list of items from the data set embedded with a pattern. The coding process evolves through an inductive analysis called ‘a cyclical process’ which goes back and forth between stages of data analysis as required until the researcher is content with the final themes (Braun & Clarke, 2006). In this regard, the researcher classified the data in different groups and put codes on them, as well as colour-highlighted the information. This method enhanced the researcher’s ability to identify the data sets without attempting to read all the detail. (See Table 5 on page 60 for further detail).

(d) Searching for themes: At this stage, attempting to combine codes is important as the combinations can form over-arching themes (Braun & Clarke, 2006). The researcher can also identify what works and what does not, and then pay more attention to broader patterns in the data (Braun & Clarke, 2013). In this study, most of the main themes emerged from the interview guide. However, additional themes have also stemmed from repeated ideas and implications embedded in the data. At this point, the researcher also attempted to address what was missing from the data, as well as identified which themes significantly connected to the data contents and which themes were insignificant.

(e) Reviewing themes and looking for sub-themes: In this phase, initial themes created need to be refined. This means that some themes may not have sufficient supports, but they could be included in other themes, while some other themes might need to be broken down into sub-themes if they are too broad (Braun & Clarke, 2006). At this stage, codes that have the same label or meaning are put together as a theme (Robson, 2011). In this study, the process is marked with different colours as shown in Table 5 (on page 60). This means that words, phrases, or sentences marked in the same colours entail the same or similar meanings.

(f) Defining and naming themes: After settling on themes, the researcher then defines and refines those themes as they will be presented in the data analysis (Braun & Clarke, 2013). Robson (2011) contends that the themes serve as a foundation for further data interpretation and analysis. At this stage, the researcher is to identify the meanings that lie in each theme and attempt to determine aspects captured. In other words, to attempt to capture the story embedded in each theme. The themes identified in this study are detailed in Chapter Four.
Finalising the analysis: By this stage, the researcher should have a set of fully-working themes (Braun & Clarke, 2006). Then substantial summaries can be drawn from the themes by the assistance of diagrams, flow charts, and linking maps (Robson, 2011). (See the diagram in Figure 9 for further detail). At this point, the researcher should be ready to finalise or write the report of what has been identified. If all stages described above adequately provide information needed, the researcher should be able to write a complex story in a way that convinces readers (Braun & Clarke, 2013).

3.5.2. Coding

Coding is a primary step in the data analysis and it is often used in correlation with thematic analysis. Coding refers to “the process of defining what the data are about” (Charmaz, 2006, p. 43). It is a process in which raw data is put into conceptual categories (Gibson & Brown, 2009; Neuman, 2012). To be more precise, Holloway and Wheeler (2013) define coding as the process of naming, labelling, and marking sections of the data. This is supported by Punch (2005) who states that coding is the process of putting names, labels, or tags against groups of data. Donley (2012) contends that coding and analysing for patterns or themes are a typical process for qualitative data analysis. Denzin and Lincoln (2000) assert that coding is “the heart and soul of whole-text analysis” (p. 780). Coding remains one of the essential tasks, and excellent coding brings about excellent research outcomes (Strauss, 1987 as cited in Gibbs, 2002). Coding inspires the researcher to move toward theoretical generalisation and encourages the researcher to think about the data and research questions at a higher level (Neuman, 2012). Similarly, Polonsky and Waller (2011) contend that data coding assists the researcher to get involved in the gathered material and to search for connections, meanings, and insights. Neuman (2012) comments that the coding process in qualitative data differs from that of quantitative data as the researcher has to organise data into more intangible categories based on concepts, themes, and similar features. Then, these sequences can be interwoven into theoretical statements, which are easy for coding. However, data coding in
qualitative data is not a simple task as it requires the researcher to attempt to reduce piles of raw data into a small, manageable size (Neuman, 2012). The data coding process of this study is as shown below.

Table 5: An example of the theme and coding process

<table>
<thead>
<tr>
<th>Themes</th>
<th>Gardening</th>
<th>Farming Diversification</th>
<th>Livestock</th>
<th>Fish pond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codes</td>
<td></td>
<td>Paddy field</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MF1</td>
<td>safe land space, grew more crops, found 1 UXO</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MF2</td>
<td>expanded garden</td>
<td>has safe paddy field; tried to expand before, but stopped because he hit UXO</td>
<td>cattle</td>
<td>x</td>
</tr>
<tr>
<td>MF3</td>
<td>safe land space, found 2 UXOs, grew different kinds of crops</td>
<td>trying to turn the land into paddy field</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>FF4</td>
<td>safe land space, grew more crops, left some part empty because lacked facilities</td>
<td>will turn the land into paddy field in future, had a paddy field</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>FF5</td>
<td>expanded garden and grew more crops and plants</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>FF6</td>
<td>grew crops only first few years and stopped due to bad land quality and lack of facilities</td>
<td>will turn the land into paddy field in future, had a paddy field</td>
<td>poultry and cattle</td>
<td>x</td>
</tr>
<tr>
<td>MP7</td>
<td>cash crop for selling, will still do even without UXO clearance</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>T8</td>
<td>small garden near house</td>
<td>x</td>
<td>some poultry for eating</td>
<td>x</td>
</tr>
<tr>
<td>TD9</td>
<td>safe land space, grew different kinds of crops, will still do even without UXO clearance</td>
<td>x</td>
<td>some poultry for eating</td>
<td>a fish pond</td>
</tr>
<tr>
<td>VC10</td>
<td>grew crops only first few years and stopped due to bad land quality</td>
<td>had a paddy</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>F11</td>
<td>grew more crops but only in first few years, left land uncultivated</td>
<td>x</td>
<td>x</td>
<td>part-time river fishing</td>
</tr>
</tbody>
</table>

3.6. Ethical Considerations

Ethical considerations play an imperative role in a research study. In this study, interactions with local people were vital; therefore, the researcher carefully and strictly considered all potential ethical issues that may emerge during and after the research. The UNITEC Research Ethics Committee or UREC (2010) states that the main purpose of ethical considerations are to protect the research participants. Hence, this research study strictly followed the UREC 2010 guidelines, and data gathering process took place after the written approval was issued by the UREC.
“Ethics is typically associated with morality, and both words concern matters of right and wrong” (Babbie, 2007, p. 62). Gray (2014) and Bryman (2008) say that when conducting research, it is necessary for all researchers to take into account ethical principles in order to avoid any potential harm that may emerge before, during, and after the research study. Sieber and Tolich (2013) maintain that ethical consideration is needed in research involving humans because participants may be vulnerable, and understanding vulnerability and under what circumstances is a complicated and nuanced matter. This is because ethical issues sometimes stem from subjective conditions which researchers may not be aware of while conducting the research. Problems can emerge at all stages of the research including planning, implementation, and reporting because contemporary research inevitably involves individuals and the issues that affect them (Gray, 2014). For instance, this particular study focuses on the topic that is concerned with UXO problems and what the researcher wanted to find out may involve deaths and injuries, which could remind the participants of their losses thus affecting their emotional feelings. Hence, as a researcher, I had to find ways to deal with this possible issue. Hence, once getting to the village, the researcher went to the temple in the village to inform a monk about the potential matter because, traditionally, the monk is capable of dealing with grief and death. This notion is in line with the assertion of Neuman (2011) which stated that researchers are required to prepare and consider potential ethical concerns while designing the study.

In this study, an information sheet and consent forms (in Lao) were utilised. Polonsky and Waller (2011) note that informed consent is necessary in order to ensure that participants fully understand what they have to provide for the research together with any unexpectedly negative consequences of their cooperation. In this study, the researcher assumed that many of the participants could not read or write. Surprisingly, they all could read and write, so they were handed the information sheet to read prior to signing the consent forms. However, some participants did not want to read the information sheet and required it to be read to them. Therefore, I did not show hesitancy and instantly read and explained all details to them. This was to ensure that they all fully understood what was involved. Israel and Hay (2006) maintain that, this way, the research participants are protected: trust can be built; integrity can be promoted; misconduct and improper issues that may reflect their personal and professional matters can be avoided; and any new and challenging problems can be coped with.

To comply with the ethical requirements, the researcher submitted the Ethical Application to the UREC and received official written permission (see Appendix 4) prior to the
commencement of the data collection. This was to ensure that all potential ethical issues could be properly considered and addressed. In addition, the NRA—the UXO/Mine Sector in Laos—was also informally informed about the research purpose and objectives. Before travelling to the research location, the researcher was handed written permission from the NRA (see Appendix 6). The written permission ensured that all parties concerned were aware of what was going on in the location. This made the researcher feel comfortable and ensured that villagers did not think of the researcher as an intruder.

When getting to the district where the research was located, the researcher took the document provided by the NRA to Nakai District Administration Office in order to notify that the researcher intended to perform the study in one of the villages in the area. The office chief then issued another permission letter (see Appendix 5) addressed to the village chief pointing out that, for further details, the researcher was to discuss with the village chief.

After receiving written permission from the District Authority, the researcher approached the village chief of the intended village. The researcher started with a greeting and later explained the research purpose while handing him all the necessary documents. The village chief immediately perceived the importance of the study and did not hesitate to allow the study to be undertaken in the village. Later on, the researcher also discussed with the village chief potential ethical issues that might occur during the process of or after the study. He said “although the village is a mixture of families from diverse locations around the area, they all share the same cultural and traditional practices, which are all the same or similar to many other places in Laos. Thus, please feel as comfortable as you can. There is nothing special here”.

However, to avoid or minimise unforeseen issues, the researcher carefully considered five key principles proposed by Tolich and Davidson (1999). These include: do no harm, voluntary participation, informed consent, avoid deceit, and confidentiality or anonymity.

(a) Do no harm: harm can be any act that offends participants in terms of both physical and mental aspects (Davidson & Tolich, 2003). Neuman (2011) states that although the risk of physical harm is unlikely to occur to participants, social researchers are likely to place anxiety, stress, and embarrassment on them. Therefore, Polonsky and Waller (2011) suggest that in order to effectively address this issue, researchers should put themselves in another person’s shoes—the participant’s shoes in this case. Harm may not immediately appear, but to avoid potential incidents, this researcher was aware of his behaviour towards respondents,
particularly the way he approached and interacted with them both physically and verbally, particularly with women who were quite shy.

(b) Voluntary participation: informants taking part in this research were all volunteers. Participants were not forced to take part; it depended on their willingness. According to Polonsky and Waller (2011), potential participants should be invited to take part, they should be under no obligation to do so, and if they choose not to participate, no negative consequences will occur to them. In this study, those who agreed to take part were informed about the research process prior to the start of the interview. Potential participants were told that they did not have to participate if they did not want to, or even if they decided to join, but wanted to withdraw later during the fieldwork process, it was their right to do so. Curtis and Curtis (2011) maintain that for the potential participants to feel able to withdraw from the study, it must be as easy as agreeing to take part. In this study, at the end of each individual interview, a small gift was given to the participant. This was not because they asked for it or the researcher wanted to reward them for providing information, but giving a gift to participants is considered culturally appropriate in Laos. Therefore, a small gift (T-Shirt) was given to each participant after the completion of the interview, and the gift did not cost over NZ$5. To ensure that giving a gift did not mean paying for the information, the participant was not informed about it prior to the interview.

(c) Informed consent: this means that prospective research informants must be fully informed about the procedures and risks involved in the research and they are required to willingly sign the consent (Davidson & Tolich, 2003). Using an information sheet is the most effective option to deal with the informed consent issue (Polonsky & Waller, 2011). Before the commencement of the interviews, the researcher properly informed all participants about the entire research process. Both the information sheet and consent forms were translated into the Lao language. This is because, from the researcher’s previous experience in the location, villagers do not speak or understand English at all. Participants required that they signed only the Lao version of consent forms. Therefore, in order to satisfy participants, only Lao consent forms were signed. In some cases, if participants had no confidence with their handwriting, they could easily put down their short names instead of signatures. The researcher was aware that asking them to sign while they were not willing to might be an offensive act. Therefore, providing them options seemed to be more suitable.

Potential participants who agreed to take part in this study were informed that after signing the consent form, they could insert it into the box (village chief election box) kept in the
village office. Each day, prior to conducting the interview, the researcher asked the respondent if he/she had signed the consent form. The consent form then was collected by the researcher at the end of the day and kept in a password-locked briefcase.

(d) Avoid deceit: to avoid deception, the researcher strictly followed the research procedure the way it was presented to the participants. Whatever the researcher had pledged to do or not do remained that way. The researcher did not promise that there would be any particular result of their cooperation. However, they were informed that the information they provided could be a good source to help pave the way to a better future for the UXO sector and other related issues.

(e) Confidentiality or anonymity: in this research, participants’ names, their village, and any other identifying features that may lead to identification of the respondents will remain confidential and anonymous, and do not appear in this thesis. This is to ensure that unforeseen problems will not arise for the research participants.

The researcher was aware that the interviews could bring up material that could be disturbing (e.g. relating to injuries or deaths). As stated above, the monk was informed about the process in order to cope with such potential circumstances. In addition, participants were asked about the tragedy issue right before they signed the consent form and at the start of the interview in order to make sure that they fully understood the nature of the questions they would explore. During the interview, the researcher always attempted to avoid unnecessary details of disturbing events and was trying to be sensitive to signs from the participant’s appearance. Fortunately, none of the respondents had lost family members as a result of a UXO incident.

Regarding information ownership, the researcher and his supervisors are the only persons who hold the right of the information contained in this research thesis. A copy of the final report of this work may be given to the NRA as it could be an important source for further study and UXO-related operations in the future.

3.7. Summary

The qualitative methods used in this study have proved to be valuable and sit well with this research. The semi-structured interviews utilised for the primary data collection played an important role in assisting the researcher to gain in-depth information regarding villagers’ livelihoods and safety both before and after the intervention of the UXO operations. In addition, the thematic analysis approach alongside the coding process became essential tools for the data analysis. This approach is the most common strategy used by qualitative
researchers. It has assisted the researcher to analyse the data in a systematic way and as such a load of data can be more easily clustered. This chapter also addresses ethical considerations, which occurred as a result of this research study.
CHAPTER FOUR

PRESENTATION OF FINDINGS

INTRODUCTION

The previous chapter summarised and justified the methodology and methods used in this study. This chapter presents findings generated from participants through semi-structured interviews. The data was gathered from 11 voluntary participants from various occupations, genders, and age groups of a village in Nakai where residents had long suffered from the threat of UXO. However, it was not possible to fill all the age categories because during the field research, most young villagers were not home as they went to work and study in cities. Hence, the researcher decided to take more participants over 30 years of age. To summarise, this research study recruited 11 participants (6 men and 5 women) including six farmers (3 males and 3 females all over 30), one military personnel (male over 30), one teacher (female under 30), one trader (female under 30), one fisherman (under 30), and one village chief (male over 30).

Table 6: Codes in numbers and letters representing participants

<table>
<thead>
<tr>
<th>Participants</th>
<th>Genders</th>
<th>Occupations</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>Farmer</td>
<td>MF1</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>Farmer</td>
<td>MF2</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>Farmer</td>
<td>MF3</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>Farmer</td>
<td>FF4</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>Farmer</td>
<td>FF5</td>
</tr>
<tr>
<td>6</td>
<td>Female</td>
<td>Farmer</td>
<td>FF6</td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>Military personnel</td>
<td>MP7</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>Teacher</td>
<td>TC8</td>
</tr>
<tr>
<td>9</td>
<td>Female</td>
<td>Trader</td>
<td>TD9</td>
</tr>
<tr>
<td>10</td>
<td>Male</td>
<td>Village chief</td>
<td>VC10</td>
</tr>
<tr>
<td>11</td>
<td>Male</td>
<td>River Fisherman</td>
<td>RF11</td>
</tr>
</tbody>
</table>
4.1. Major changes after the UXO operational intervention:

4.1.1. Safety and convenience

Since the intervention of the UXO operations including UXO clearance and risk education activities in the area, a number of changes have occurred. Some participants identified a few changes while others raised several positive points as consequences of the UXO operations. Safety, convenience, and opportunity for development are some of the key topics that all interviewees could easily point out.

All participants said that safety is the biggest change while six of them identified the changes as including convenience and three of them said opportunity for agricultural development is also an important part of these changes. They all indicated the changes by comparing the present to the past. As one of them said:

_There have been many changes since UXO operational intervention. It is convenient for people to do things such as looking for food, working in the paddy fields and gardens. It is safe to bulldoze anywhere that has been UXO cleared. I was not brave enough to do so in the past. Even if we worked, we had to be so careful. It is the convenience that I value now. Digging for frogs and crabs is easy because I am not worried about hitting UXO anymore. I am happy and I am not afraid now. Before, I was so scared_ (FF4, interview, June 18, 2014).

Another respondent who used to work in a youth union said that safety was the most significant consequence of the UXO operations. She explained the situation surrounding a past accident and how safe it is now. She maintained that:

_It is very good after the UXO clearance. Recently before UXO teams came here, a woman hit UXO in her garden and was killed. After that, two companies came here, as I remember, to perform UXO operational tasks in this area. Since then, there has not been any UXO explosion and people are safe now. Safety is the most outstanding change. It improved more than any other circumstances. Now, the nearby vicinity has all been UXO cleared. Kids are safe too when there are no UXOs in the close proximity_ (FF5, interview, June 20, 2014).

It is not surprising to note that participants who have been involved in village activities knew a lot about the UXO operational tasks and had the capability to identify more consequences of the UXO operations. The village chief explained these consequences as follows:
There are several significant changes after the introduction of the UXO operations in the village. First, it is convenient to work and look for food. Second, it is safe to perform farming and gardening activities. People are no longer afraid that UXO will explode on them. Third, five to six years since the UXO operational intervention, there has not been any UXO accident around this area. Before, on average, in a year, one or two people were killed or injured due to the UXO related problems. It exploded on them when they were digging the ground on rice fields, gardens, and when children were digging for earthworms for fishing purpose. Since the UXO operations took place in the area, there has not been any accident. It is safety that matters the most (VC10, interview, June 22, 2014).

Another interviewee who used to be a village chief also identified several points that he thought were the consequences of the UXO operations. He commented that:

There have been many changes since the intervention of UXO operators. First, villagers’ living conditions have been improving because it makes things easier and comfortable for farmers. In the past, one or two people were killed or injured each year because of UXOs. It is safety that is significant. Second, in terms of development, people dare to do whatever they want on the ground because most of the land areas around here are free from UXOs (MF2, interview, June 30, 2014).

Another perspective regarding safety came from a teacher who works at the village primary school, but has a vegetable garden right next to her house. She said:

After the UXO operations, many things have been improving. For example, it is safe to work on the ground in a rice paddy and a vegetable garden. There are no more UXO explosions and people are safe. At school, when students clean up the school yard, such as digging out tree stumps and digging the toilet area, it is safe for them. When they do not go to school, they like going out to find food such as digging for crabs and crickets; they do not find UXO anymore. These are the good things (TC8, interview, June 26, 2014).

Surprisingly, besides safety, convenience, and opportunity for development, three respondents pointed out that UXO clearance has helped them to work on the ground faster. This is because they no longer had to be careful of the UXO danger while digging the ground. As one of them said:
When digging the ground to put up fence posts, we can work fast because we know that the ground is safe. Before, we had to dig slowly and carefully because we were scared (FF6, interview, June 21, 2014).

In addition, one respondent complained that the fear of UXOs slowed her down when she worked in her garden. This implies that if there were no UXO threat as an obstacle, she might be able to work faster. She commented that:

*Before the UXO clearance, I had to be very careful because I did not want to hit something and it explodes. It made the work slow because I had to dig the ground softly and slowly* (FF5, interview, June 26, 2014).

### 4.1.2. Opportunity for development

Two participants identified that UXO operations have paved ways for development. They said that without UXO clearance, basic infrastructure could not be built as developmental organisations would not enter the area. They explained that:

*UXO clearance has made it safe and convenient for developmental organisations to come to the village. Because the land is free from the UXO danger, fundamental infrastructure including roads, school, and water can be built. I don’t think NTPC would be brave to build houses and other infrastructure if UXO clearance companies had not come here and cleared the land first* (MP7, June 24, 2014).

*In terms of development, many things can be built after the UXO clearance because it is safe to do anything* (MF2, interview, June 30, 2014).

### 4.2. Diversification of farming

In spite of different occupations, all participants are involved in one or another agricultural activity. They all agreed that UXO clearance has provided them safe, and more, land spaces to grow different kinds of vegetables and other cash crops. All of them said they have grown more crops than before and some said they grew enough to feed family members, while others could even sell vegetables in the local market. As one of them said:

*I grow more vegetables and other sorts of crops since my garden has been UXO free. I do more because I am no longer scared of hitting UXO* (FF4, interview, June 18, 2014).
One informant tried to compare, by using an example, the differences between the UXO cleared land and the land that has not been cleared and how the two pieces of land could produce different amounts of agricultural products. He explained that:

>Certainly, if you grow some kinds of plant on the UXO cleared land, you will be able to grow more in quantity. You do not worry about hitting UXO. You can grow things on every square meter of the land, you can grow more and of course you can harvest more products. On the land that has not been UXO cleared, people certainly grow fewer crops because they have to leave pieces of land uncultivated if they find UXOs on them. They won’t go near it. In fact, many families would leave that piece of land without planting anything on it (RF11, interview, June 23, 2014).

The teacher participant also gave her comments on the state of farming in a similar manner. She said:

>It is very good for farmers and gardeners because their land is safe. They do not hit the UXO when they dig the ground to grow crops. They are free to dig anywhere when the area is UXO cleared. In addition, to grow crops in the UXO free area, you can grow more and you can harvest more products. To work on the land without UXO cleared, it takes times because you do it slowly. You can do very little, so you get a small amount of produce (TC8, interview, June 26, 2014).

While many of the participants enjoyed their safe and larger pieces of land for performing different kinds of agricultural activities, two informants expressed that they were attempting to turn their land into permanent paddy fields where they could grow rice without moving from place to place. As one of them said:

>In the area of 0.66 hectare, I have turned some part into a garden and am trying to turn another part into a paddy field. Before, we did not have a paddy field. We just began this kind of agriculture two years ago. We only practised shifting slash-and-
burn cultivation on which we grew rice only for eating by the family (FF4, interview, June 18, 2014).

Another participant added that:

I am trying to turn that place into a paddy field. UXO clearance has enabled me and my family to start to work on that piece of land. The place is much safer now although I still have come across some UXOs. It has made my life better because I can plant trees and grow crops on that land. I did not do anything on it before because there were plenty of UXOs. I was not brave enough to work on the land full of dangerous UXOs. I remember one day when the area caught fire and there were lots of explosions... [bang, bang, bang]... It was like in the war. I just started to work there after the UXO clearance. I heard they found hundreds and hundreds of UXOs in that area. Now I grow rice, banana trees, and sweet potatoes. I do not leave any space on my garden (MF3, interview, July 2, 2014).

However, although two interviewees said that they wanted to turn the land into a paddy field, they lacked resources. As one of them said:

I want to turn the land into a paddy field, but I still lack capital to pay for a bulldozer to level the land (FF5, interview, June 21, 2014).

Interestingly, a military officer participant has turned the UXO cleared land into a cash crop growing field. Although working for the local government, he spent the weekends working on the land. He explained that:
Now, my house area and my garden are UXO free. I can grow anything on the land and I grow many more crops and plants than before. I grow many kinds of cash crops such as pineapples, banana trees, and mango trees. I grow these sorts of crops for selling. It’s my intention (MP7, interview, June 24, 2014)

Many of the respondents claimed that if there had not been UXO operations in the village, many pieces of cultivating land around the village would have been left uncultivated. They would have been practising the traditional way of agriculture—the shifting slash-and-burn. As one of them said:

If there had not been UXO clearance, my land would have been left without any plant or crop. It would be like a jungle. Nobody would be brave enough to enter the place. Nobody would dare to burn and dig the area because it was full of UXOs (MF1, interview, June 29, 2014).

This is highlighted by another respondent’s statement who expressed that:

My paddy field, if there had not been UXO clearance; it would certainly have been left uncultivated. I would not dare to plough it. Once I dug the soil in my paddy field, I hit something and that turned out to be a mine [bombie]. I was so lucky it did not explode. If it did, there would have been at least 2-3 people killed or injured as we worked closely together (MF2, interview, June 30, 2014).

It is bad news to find out that two participants have still found some UXO items on their cleared land. As one of them said:

I have found two bombies on my land which was cleared by UXO teams a few years ago. My land is 0.95 hectare. I have seen the bombies, so I do not know how many could have been left underneath the ground. I reported to the village chief about it, but nothing has been done (MF3, interview, July 2, 2014).

It is interesting to note that participants who have found UXOs on their land still keep working on the land. For some participants, they said they have not found any UXO on the cleared land, but left it uncultivated. Three participants contended that they had to leave the land uncultivated because they lacked labour and money to build fences and some said they used the land only in the first few years after the UXO clearance because the land was no longer fertile. As one of them said:
I have not planted anything on the 0.66 hectare land provided by NTPC, but my grandson is trying to clean it up. He paid the bulldozer to level the place nearby and turned it into a paddy field. It is where they dumped the dirt from the channel and we created the paddy field over there, but we have not done anything on the 0.66 hectare. They told us next year to turn it into a paddy field because there is too much grass if we were to use a slash-and-burn cultivating style. I left it empty because I cannot build fences around the area. Cows are stubborn here. You have to put up fences around your land if you want to grow something. I also do not have enough money to pay for a bulldozer to level the land and turn it into a paddy field (FF4, interview, June 18, 2014).

However, she later said that she would certainly try to do something with that piece of land when she had some money.

Another respondent also explained why she only used the UXO cleared land in the first few years and why she had to leave it uncultivated. She explained:

NTPC projects also led villagers to grow different kinds of crops on the UXO cleared land they provided, but some people followed them, other people did not. I followed them in the first few years, but later on neglected some projects because we did not have enough labour force, only me and my husband. We grew rice and it was good in the first year. The second year was still fine, but the third year was not so good because the land quality has faded. I do not grow anything on that piece of land now because I do not have man power. I grew cassava before, but not now. The land is empty. We only focus on the paddy field which we started last year. We have to put up fences because there are many cattle. If the fences are not strong enough, cattle can break in (FF6, interview, June 21, 2014).

In contrast, one participant argued that he has grown rice and other kinds of crops in the same piece of land for a few years already and they still grow well. He contended that:

I have been working on my garden for three years already. I have never used any fertilizer, but my crops seem to grow well. They are as good as the previous years. I grow crops naturally, no fertilizer (MF3, interview, July 2, 2014).

However, to further clarify why some villagers have left their land uncultivated, the village chief pointed out a number of reasons: He commented that:
Regarding agricultural activities, it is convenient, but some families do not work hard enough. Another difficulty is that villagers have to put up fences around the UXO cleared land. Villagers have proposed NTPC supply barb wire, but we have not been supported while some other villages have received some barb wire. Another reason that many families cannot plant crops is they do not have enough labour force. Some people are widows who cannot work hard like men. Some families have their land blocks right next to other people’s land and if one family cannot put fences up, the rest do not want to do that either. There are eight families in this village who are widows and lacking male leaders to help them to do the gardening. They have fence posts, but they are not capable of going into the forest to fetch more trees for fencing. Fences usually last for a year. Some people went to cut trees, but had no vehicle to bring the trees home. Most of them are widows who cannot do this job. In addition, there are many cattle around here, but most of them belong to the neighbouring villages. July and August is the period for vegetable growing, so if fences are not strong enough, they cannot keep cattle away.

Once cattle get into one garden, they can go through to other gardens. These are the difficulties (VC10, interview, June 22, 2014).

Interestingly, respondents came up with a number of perspectives regarding the agricultural circumstances after the UXO operations. Some said having spacious and safe land was the key factor that helped them to grow more crops because they had the freedom and convenience to cultivate the land; while others explained the UXO cleared land would certainly provide more produce than the land that had not been UXO cleared. In fact, the participants said the UXO contaminated land would not have given them any produce because they were not brave enough to risk their lives cultivating such dangerous land. Some participants had tried to cultivate the land, but had to stop proceedings because they had found UXOs. From another point of view, two informants insisted that they would have had
to cultivate the land even if it had not been UXO cleared because they did not have many options.

It is striking to know that those who have found UXOs on their cleared land still keep using the land without fear, while those who have not found any UXO on their land have since left it empty. Some said the land quality faded after the first few years of cultivation, while others said they lacked capital, facilities, and labour power. However, some said that they would do something on the land once they have enough money.

### 4.3. Land ownership and redistribution

Seven of the participants have received 0.66 hectare as a compensation for the resettlement. As stated in the literature, the village has been resettled to avoid the flood created by the hydropower system operated by the NTPC. The minority of households who have not been resettled were not handed the UXO cleared land because these families had already been in the location before the start of the resettlement. However, most of the pieces of land owned by families prior to the resettlement process were included in the NTPC project areas. Therefore, these pieces of land have also been UXO cleared. Luckily, the other four participants have also had their land cleared. Regarding the area of their cleared land, it depends on whether or not the land was covered by the project area.

In addition to the 0.66 hectare of land, most families were handed another piece of land (0.2 hectare) called ‘irrigational land’. According to the village chief, however, a complicated map of this piece of land was given to the village. As a result, the land borders were complex and ill-defined and some families were not sure where their land borders really were. Subsequently, some did not want to cultivate the land because they were afraid they would mistakenly use the land that belonged to someone else. The village chief commented that:

> We do not know what part of the land belongs to whom. This is so complicated. Some people wanted to use the land, but they cannot because they didn’t want to plant something on the land that might belong to other people. Some families have grown some crops and plants on that piece of land. These families have their houses right next to the land, so they know for sure the land belongs to them (V10, interview, June 22, 2014).

It is also interesting to note that if the family leader (either father or mother) is a government official, the family was not entitled to the 0.66 hectare of UXO cleared land, unless the family had land that was flooded due to the consequences of the dam system. On the one
hand, a military personnel participant received the land because he previously owned a piece of land which is now flooded. The teacher participant, on the other hand, did not receive the land because she is a government official who had not owned a piece of land before the resettlement. However, she was provided with a new house like most other participants and a small piece of land next to the house for gardening.

One farmer participant who received neither the house nor the UXO cleared land was still compensated because his land was covered by the project area. Therefore, all of his land (about 0.95 hectare) was UXO cleared. He said:

*I was neither given the 0.66 hectare land nor the house because I moved here before the commencement of the resettlement project, but I'm still lucky that my land, which was full of UXOs, has been cleared as it was within the project vicinity (MF3, interview, July 2, 2014).*

Another participant has a large piece of land (about 3 hectares) next to her house and it was UXO cleared because the land was in the NTPC project area. She has so much land that she has even left some uncultivated because she said she and her husband were too old to work hard. She commented that:

*I also have another piece of land across the creek and it has been UXO cleared, but I don’t do anything on it now because my husband and I are quite old and we don’t want to work too hard. At the moment, working on this same piece of land is enough (FF5, interview, June 20, 2014).*

The proportion of land distributed to villagers seems to be an issue. Although most families received 0.66 hectare, some left the land uncultivated while others needed more land. For example, one respondent complained that he wanted to get more land to grow cash crops, but he was not allowed. He further insisted that even if the land had not been UXO cleared, he would still have worked on it. He said:

*Even if I had not received the UXO cleared land from NTPC, I would still do gardening. I wanted to do much more than I do now. I was given a certain width of land, so I just use the whole plot for gardening. I cannot own any more land. If I could get more land and even if it had not been UXO cleared, I think I would still turn it into a garden and plant many things, but I would have to be very careful*
when digging the ground. I would use a shovel and a spade instead of a hoe (MP7, interview, June 24, 2014).

A trader participant who also partially works on her garden maintained she wanted to expand the area of land she has because of the growth of her family. Hence, she would have continued to work on the land even if it had not been UXO cleared. She said:

Another reason I had to start planting more crops and plants on the other side of the creek is that there are more and more people in my family. Even if it had not been UXO cleared, I would still have to work on that piece of land. I would just have to be very careful (TD9, interview, July 5, 2014).

4.4. Household economic conditions

Most of the participants agreed that since they have had safe pieces of land, the status of their families and their quality of life has been improving. Many of them have grown crops and planted fruit trees enough for the family. Some respondents have grown cash crops and cash trees for selling such as agarwood\textsuperscript{6} and red wood on their UXO-free land, while others said that sometimes they sold agricultural products and earned some money to buy some food ingredients. One of them commented that:

Eh... my family status is better now when compared to the past because we can grow vegetables for eating and sometimes for selling. We can earn some money to buy salt, monosodium glutamate (MSG), and other food ingredients and sometimes we can buy rice. It is convenient for anyone to do anything including planting chilli, papaya, and other kinds of crops for selling. We can do what we want as long as the place is safe. Before, we were not brave enough to do things like this. We were too afraid because there were so many UXOs (FF4, interview, June 18, 2014).

Another participant added to this notion:

Now my life is better because I can grow more crops including vegetables, grass to feed buffalos and cows. I have enough food to feed my family. Before, I grew very few crops and it was hardly enough to eat, sometimes not enough at all (FF6, interview, June 21, 2014).

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\textsuperscript{6}Agarwood, locally known as Kedsana tree, is resinous heartwood that forms in Gyrinops and Aquilaria when infected with a kind of mold. The resin from agarwood is valuable for its distinctive fragrance and is used for perfumes and incense (Blanchette, 2006)
In addition, most of the interviewees agreed that the NTPC projects have contributed a great deal to the development of their family’s economic status. They also realised that without UXO clearance, things might not be as they are now. As one of them said:

*It is also because of NTPC projects as they took lead in providing us with agricultural knowledge and skills, but if the land had not been UXO cleared, I would not dare to grow anything in my garden* (MF1, interview, June 29, 2014).

From another point of view, one participant explained that growing cash crops has helped him to gain some money for the family. He said:

*UXO clearance has helped families in many ways. They can grow and plant crops and trees in a full capacity now because they are not afraid of UXOs. Therefore, people can produce more out of the land. I planted cassava in the first two years after the UXO clearance. They had a factory in the town nearby. I sold to them and I could earn a fair amount of money for my family* (RF11, interview, June 23, 2014).

Meanwhile, a military officer contended that when the land was safe and when a family member had not been affected by a UXO incident, there was no burden so everyone could help each other build up the family’s economic position. He expressed that:

*When you are safe, you can do anything you want. You help your family to earn money through crop products as you can sell them in the market. If someone in the family is hurt because of UXO, you will have to look after one another and you spend money doing so. When the environment is free from UXO, it is safe to do anything and your family is happy* (MP7, interview, June 24, 2014).

Based on the respondents’ point of views, UXO clearance has substantially enhanced their family economic status. Being able to access the land and grow crops for both eating and selling has helped do this, thus resulting in a better quality of life. It is also interesting to note that the assistance of the NTPC has played a crucial role in the improvement of the family economy as its livelihood projects, particularly the agricultural project, have facilitated participants’ opportunities to perform their agricultural activities in a more efficient way. From these points of view, a conclusion can be drawn that UXO clearance and developmental projects are the two key factors contributing to the improved family economy.

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4.5. Improved food security

Generating food from safe sources is essential for all the villagers in the UXO-contaminated area. All interviewees acknowledged that UXO clearance has provided them access to land where they can grow crops to generate food. Two respondents said that they did not have to go to the market to buy some kinds of vegetables as they could grow them in their gardens. The village chief who used to go out fishing in a place which he said was full of UXOs said the location is now safe. He commented that:

Before the UXO clearance, the place near the former Vietnamese military base, nobody dared to go and look for food over there. There were many big bomb craters and when flooded, they became fish ponds. I once went there and used fishing net to catch fish and when I pulled the net, I heard UXOs bumping with each other... [click, click, click]... Later, I never went there again. The place has been UXO cleared now. I think around 70% of the area has been cleared anyway (VC10, interview, June 22, 2014).

Another informant added that some places where villagers did not go near due to a staggering amount of UXO have also been cleared and are safe for those who like to go into the jungles to find forest products. He expressed that:

I noticed villagers can have access to more food sources after UXO clearance because the UXO team has cleared many of the areas that villagers often go to look for forest products. Therefore, we are not afraid when doing so. This is one of the better points. We have no fear when digging for crabs and other creatures. Before, there were a few locations where people did not go because there was a large amount of UXOs. No one wanted to go near there. Now people go to those places to get bamboo shoots, bush vegetables, and mushrooms. Children can go to these places to dig for crabs and crickets. It is safe for them now (RF11, interview, June 23, 2014).

One interviewee said that she has grown different kinds of fruit trees, which can be harvested all year round, and she has also planted some valuable trees, which possibly in the next 10 years or so these trees will make her a lot of money once she sells the wood products. She said:

I planted banana trees, sugarcane, jack fruits, and mango trees. I can grow anything without banging on UXO. I also plant agarwood. I have many grandchildren, so I
do not grow for economic purposes. My grandchildren will come and get what they want when I harvest. It is just enough for my big family. I grow for eating, not for selling. I grow many kinds of fruit trees so I can harvest fruits all year round (FF5, interview, June 20, 2014).

Another respondent said that he did not have to buy rice from the market since he has a safe piece of land to grow rice. He said:

_Now I do not have to buy rice from the market. UXO clearance has helped me to have enough rice for my family. I am not afraid to do anything on that piece of land now_ (MF3, interview, July 2, 2014).

However, he said that he still had to be careful when digging the ground as he has found two bombies on his land.

Similarly, two informants said that they did not have to go to the market to buy vegetables since they could grow them on their own land. As one of them said:

_Of course, I have more sources of food for my family after UXO clearance. Like I said before, I grew more crops and plants in my garden and I do not have to buy from the market. If I buy, I just buy some, not as many as before. I also built a fish pond behind my house_ (TD9, interview, July 5, 2014).

According to the participants, UXO clearance has assisted them to access the food sources in places where, as described by some, _‘no one’_ wanted to go near in the past. In addition, growing different kinds of crops such as rice, fruit trees, banana trees, sugar canes, and building a fish pond meant that participants are able to access more food sources. Some respondents said that they did not have to buy vegetables from the market since they could grow them on their land. However, in terms of access to the forest products, all participants agreed that not everywhere around the village was safe. For example, one respondent explained the place he went fishing as _‘around 70% of the area has been cleared’_. This means that about 30% has
not yet been cleared. However, all interviewees agreed that they could generate more food from the cleared land.

4.6. Gender difference in attitudes towards UXO issues

It is worth noting that, although participants came from different groups in terms of age, occupations, and gender, all of them were involved in one or another agricultural activity. Therefore, they tended to come up with similar view points about the UXO issue. However, some differences could be identified between the male and female participants. Women were found to be quite shy and spoke less when compared to men. Women also seemed to carry greater psychological concern for family members than men. These characteristics can be noticed when the researcher asked a question ‘What concerns you most about UXO?’ Most of the female participants answered in a similar way. As one of them said:

*UXOs are dangerous and they made me worried that my children, my husband, or someone I know would get involved in an accident. I think if some I know were injured or killed because of UXO, I would cry to death and I would not know what to do next. I would live in desperate poverty if I lost my husband because he is the family leader upon whom the family depend* (FF6, interview, June 21, 2014).

Meanwhile, male participants voiced their concerns about agricultural activities. They said that their life status relies mostly on agriculture and that if their land was full of UXO, they would not be able to grow anything on it, or they might just take risks if they did not want to stay hungry. One of them elaborated:

*What concerned me the most was that I could not cultivate the land on a full scale when it was full of UXOs. I had to be very careful when digging the land. I was worried that my family would stay hungry if I could not grow enough rice. Sometimes, we as men had to move the UXOs out of the way so that we could perform activities more freely and children would not see and play with them* (MF1, interview, June 29, 2014).

4.7. The state of relationships with partners, children, relatives, neighbours, and other villagers

To my knowledge, there has not been any study in Laos focussing on the state of relationships as a result of the UXO operations. Thus, this is a new focus and it is a striking point to find out that all participants said UXO operations, particularly the RE, have helped
them to have closer and more joyful relationships with other people. In addition, they agreed that their worries about UXO incidents have vanished. They are no longer worried that their children and people they know will engage in a UXO accident. As one of them said:

*It is not only relationships that have improved, but everything else. The UXO team has brought villagers together, especially the RE team as they always had some topics for villagers to talk about when they came. People spoke more to each other, as well as to their family members. Before, people were so worried about their children. They always had to warn their children not to go near UXOs and be very careful when searching for bush vegetables and bamboo shoots. Now, no one is worried about anyone else about UXO* (VC10, interview, June 22, 2014).

The notion is well-supported by another participant who expressed that:

*After the intervention of the UXO operations, relationships within the family, with villagers, and with neighbours are much better than before. For example, it is convenient to go and see one another. Parents have no worries about their children. I do not have to warn my children about UXO when they go somewhere or do something. I am very happy to let my children play around anywhere they want to. I do not hear that someone in the village is dead or injured due to the UXO accident. I am not worried that people I know will be involved in a UXO accident. It has taken away all my worries about UXO since the teams came here* (RF11, interview, June 23, 2014).

Two informants said that instead of being worried and constantly telling their children about the UXO danger, they are now attempting to encourage them to focus on studies. As one of them said:

*Of course, it is much better because there are no more accidents, no one gets hurt and this means that people have no worries. Instead of talking about UXO accidents, people enjoy talking about other topics. For example, instead of warning my children about the UXO issue, I tell them to focus on their studies and help me work on the farm at weekends* (MP7, interview, June 24, 2014).

Astonishingly, two participants said that UXO clearance has stopped them from arguing with neighbouring villages in terms of the land ownership. They said when they used to practise
the shifting slash-and-burn cultivation, sometimes they mistakenly invaded other villagers’ land and they ended up with bad relationships. They expressed that:

_We do not have to go to other villages for land to grow rice because the land nearby is all UXO cleared now. Before, villagers would hunt for land from other places when the land near the village was full of UXOs. Sometimes other villagers were not happy as their land was taken by their neighbours_ (FF6, interview, June 21, 2014).

_We do not have to invade the land in other villages’ vicinity when the land around the village here has all been cleared. Neighbours do not have to blame or fight for land as every family has their own land free from UXO now_ (VC10, interview, June 22, 2014).

It was surprising to know that UXO operations have had something to do with the respondents’ relationships with other people. Most participants described the state of relationships as ‘without worries’ after the UXO operations. Some informants tried to compare the situation between the past and present by saying that they had to ‘warn’ their children about UXO when they played around before the UXO operational intervention; and now they are ‘no longer worried’ that children and people they know would be involved in an UXO accident. Some said villagers had more chances to socialise when the RE team organised sessions in the village, and adults had more topics to talk to their children about when returning home. As a result, the relationships among family members and villagers have become, as described by some respondents, ‘tightened’. In addition, two participants said that instead of talking about UXO issues, they talked to their children about studies. Interestingly, the other two interviewees expressed that they did not have to mistakenly ‘invade’ the land that belongs to other villages since they have had their own land. As a consequence, there have not been ‘arguments or fights’ between neighbours for the land.

4.8. Improved transport infrastructure

In the UXO contaminated locations in Laos, roads cannot be built unless UXO clearance is undertaken. In this study, all interviewees mentioned that the transport situation in the area is much easier and convenient now. They can go around the area without fear of kicking or stamping on UXO. Many of them said that roads have been built and without UXO clearance, roads could not have been constructed. Some said that they saw piles of UXOs along the old roads in the past and some of the UXOs were colourful which could attract children’s attention who passed by. As one of them explained that:
UXO clearance has helped improve the transportation in this area, it’s in a good condition. It is convenient now to travel to places nearby. It is also easy to visit neighbours as roads have been built and are free from UXOs. Before, there was one old road where trucks would cruise through and one day a truck ran over a mine. Parts of the truck were blown out this big...[stretching out his arms]... People had to be careful. Now that road has been cleared (VC10, interview, June 22, 2014).

The notion is backed up by another participant’s view point. He said:

It is convenient to go anywhere now because roads were built and are safe from UXO. Before, when you travelled along the roads, especially the road from here to the next village, you would see many UXO items lying on the edge of the road. Some of them were colourful and some were as big as the house post... [pointing to the post near where he sat]... Now you cannot find any. You can go anywhere both day and night and you are not afraid of kicking UXO. Without UXO clearance, many roads may not have been built and that would be difficult for transportation in this area (RF11, interview, June 23, 2014).

All participants described the condition of the roads in the area as ‘safe’ and ‘convenient’ to travel around and ‘free’ from UXO. Many of them said they were no longer afraid of kicking or stamping on UXO. They said roads in the area were built following the UXO clearance. Some said the roads make it easy to visit neighbours as vehicles can now comfortably run through. One respondent raised an example of the road conditions in the past which he said had been full of UXOs and he described some of them as ‘colourful’ which could attract children’s attention. He said some UXOs were as huge as the ‘house post’. Now, the roads are free from UXO.

4.9. Unexploded ordnance-related accidents, deaths, and injuries

All respondents agreed that there had not been any UXO-related incidents since the intervention of the UXO operations. However, they all confirmed that they either had seen or heard about UXO accidents in the village and their neighbouring villages in the past. As one of them said:

There have not been any UXO accidents since the intervention of UXO operations. As far as I know, I have never heard of any accident in this community of 15 or 16 villages since then. Before, there were many UXO accidents. One example was where a woman was digging the ground in her garden for planting chilli. She used a
hoe to dig the ground, and she banged on the UXO. She was killed immediately. Many villagers found UXOs when they worked on their gardens and rice paddies. Some hit UXOs and died or were injured when the things went off. It was so dangerous before (FF5, interview, June 20, 2014).

The statement is aligned with the viewpoint of another respondent who said:

I have not heard of or seen any UXO related accident recently, but I saw some in the past. One accident caused a young boy to become disabled. He did not die because he was hit by some UXO fragments. It happened while he was digging for crickets just near his parents’ house. Some people, especially children, were naughty and liked to play with UXOs by throwing them at a rock, log, or the stump and the thing went bang (MF3, interview, July 2, 2014).

The situation of children playing with UXOs was confirmed by another interviewee who expressed that:

Five to six years ago, two kids playing with a bombie got badly injured when the thing exploded on them. They were taken to the provincial hospital. It was said that they tried to throw the bombie at one another, when one threw, another would catch it. They were curious what it was and wanted to see what was inside, so they smashed it onto flat timber where the thing went off causing the two bad injuries. Two more kids had an accident a year later. They went out to get bamboo shoots and while digging, they found something and were curious to know what it was. They tried to dismantle the thing and it detonated, but they did not die, just badly injured (VC10, interview, June 22, 2014).

Innocent children playing with UXOs seemed to be the main cause of UXO related accidents in the village in the past. Participants said that children had not realised how deadly the items could be so they would play with the things for fun. Children often had found UXOs when they dug the ground for crickets, crabs, or earthworms for fishing. Sometimes they had tried to break the objects apart to see what was inside and the things would explode causing deaths or injuries. As one of the participants said:

In the past, accidents mostly happened to children. They dug the ground for food like crabs, crickets, and bamboo shoots. Some of them did not know and played with the items, especially children (FF6, interview, June 21, 2014).
In fact, UXO related accidents in the past had occurred not only to children, but also to adults who performed different kinds of tasks concerning agriculture. As one of them explained:

Another accident happened to a man near here. It occurred when he was cutting trees and grass out of his garden. His machete hit it and it exploded. He was badly burned by its smoke. His garden has not been cleared (TD9, interview, July 5, 2014).

One interviewee pointed out that some UXO-related accidents were the result of scrap metal collection, which involved both adults and children. He said:

There were some accidents due to the search for UXO fragments for selling in the past. People involved including adults and children. One of the causes of accidents was scrap metal collection, and another cause was innocent children trying to play with the things and throwing them at stumps or rocks. Children this big...[pointing to one of his sons who is about five years old playing in front of the house yard] will not know the danger of UXO (VC10, interview, June 22, 2014).

Taking another point of view, one respondent expressed that UXO accidents had occurred when people tried to intentionally dismantle the items because they wanted to sell the valuable parts or use the explosive power inside the ordnance to reassemble new explosives for fishing purposes.

Here, UXO accidents were mostly caused by carelessness of those who wanted to get both the metal for selling and the powder inside the UXO items. They tried to dismantle it and sometimes it exploded. I heard they used the powder inside to generate some kinds of explosives and used them for fishing purposes. Adults like 20 years and older liked to do this (RF11, interview, June 23, 2014).

It is distressing to find out that those injured by UXO accidents had not been treated in the local hospital because of the lack of specialist doctors and medical facilities.

Those who got injured had to be taken down to the provincial hospital. The district hospital could not deal with operations. They did not have good equipment and doctors were not specialists. They could not deal with badly open wounds (VC10, interview, June 22, 2014).
Although causes of UXO-related accidents in the past had stemmed from a range of activities associated with agricultural practices, these incidents have not happened since the intervention of UXO operations.

Figure 14: Common causes of the UXO-related accidents in the area

4.10. Scrap metal trade

The scrap metal trade has been claimed as one of the major causes of UXO-related accidents in Laos in the past decade. In this study, all interviewees confirmed that they have not dealt with in the scrap metal business since the intervention of the UXO operations. However, one respondent reported that she used to deal in scrap metal trade, and all of them reported seeing other people doing it in the past. As one of them said:

*I have never dealt in the UXO scrap metal trade, but I saw some people doing it in the past. I do not think they earned a lot of money from scrap metal. Maybe they just earned some money to buy cigarettes or candies for their children. Some people who were diligent may have earned some money to buy salt and monosodium glutamate (MSG), but those who were lazy did not earn...*
much at all. In addition, the scrap metal was cheap at the time (MF3, interview, July 2, 2014).

Two participants said that the scrap metal business was still going on, but people did not sell UXO parts. They traded automobile parts and other non-UXO items instead. As one of them expressed that:

*After the UXO clearance, I only saw Vietnamese traders coming around and collecting scrap metal, but there are no more UXO fragments for selling now. They just collect pieces of metal from broken bikes and other stuff. I have not seen any villagers selling UXO fragments to traders any more now* (RF11, interview, June 23, 2014).

Interestingly, one interviewee said that she used to collect parts of big bombs and sold them to wandering traders in order to get some money to buy candies for her children. However, she argued that collecting scrap metal to sell was not the main source of the family income as the scrap was cheap. She also added that she did not regret when the UXO team came in and took away parts of UXOs as the team also brought in safety. She explained that:

*I used to collect and sell scrap metal including UXO fragments in the past, but I did not find much. I just searched for metal where I found bomb craters and I could get 4-5 kg or 9-10 kg. Many people were doing that, not only me. I could earn 10,000 - 20,000 Kip (about NZ$2-3). It was cheap before, only 100-200 Kip per kg. Since UXO teams came here, there is none left because they also collected the scrap metal. I did it in the past. I collected pieces of big bombs that they have already exploded. I did that when I went into the forest to get bamboo shoots. When I found the live ones, I immediately escaped [laughing...]. When UXO teams came in, we could not do it again. I only collected scrap metal to sell for some money to buy candies for my kids. I do not regret that UXO team took away all scrap metal because they made the land safe for me and I am not afraid now* (FF6, interview, June 21, 2014).

Buying candies for children seems to be an excuse for some people to search for parts of UXO because the respondent who said she had never dealt with the scrap metal said that her grandchildren used to collect UXO fragments for selling to earn some money for buying candies. She said:
I have never sold scrap metal, but my grandchildren did it before. Sometimes the UXO clearance team left a pile of scrap behind and children would collect and sell to Vietnamese traders. They sold it to get a bit of money enough for buying sweets, not enough for buying food [laughing...]. It was not even enough for buying salt or chilli. My children collected scrap metal when they went to the garden. They sometimes picked up 1 or 2 kg and sold to earn 2,000-3,000 Kip per time because 1 kg cost 1,000 Kip then, which was enough to buy some sweets for themselves. I did not see that anyone could collect 50 or 60 kg of UXO fragments to sell (FF5, interview, June 20, 2014).

Although the majority of the interviewees said they had not dealt in the UXO scrap metal trade, most of them agreed that they had seen other villagers or their neighbours doing so in the past. As one of them explained:

In the past, I heard a lot about the scrap metal trade in the neighbouring Boualapha district where people searched and dug for bombs to get parts. Here they did not do it, so there was no problem about this matter. However, I saw that some families did sell some scrap metal, but mostly other kinds of metal such as parts of motorbikes and some were pieces of big bombs they found in the jungle. I have never sold scrap metal [laughing...] I was so afraid [laughing...] (MF2, interview, June 30, 2014).

It looks like the scrap metal trade was not a major concern for the respondents because 10 out of the 11 confirmed that they had not dealt in the business. Many of them said the cost of metal at the time was too cheap to convince them to be involved; while some said it was not a major source of the family income.

Despite not dealing with the scrap metal business, all the interviewees agreed that they had heard about or seen other villagers doing it. This is confirmed by one informant who said ‘many people were doing that, not only me’. Some respondents referred to another district ‘Boualapha’ of being an area heavily involved in the scrap metal trade. In fact, Boualapha is the heaviest UXO contaminated district in Khammouane province.

4.11. Unexploded ordnance clearance effectiveness

All interviewees agreed that UXO clearance had been thoroughly conducted because there had not been any UXO related accident since the teams entered the location. Although two of the respondents had found UXOs on their land, they considered the clearance had been relatively thorough. As one of them stated:
I think the UXO team did a good job because I have not seen any UXO left in my garden, but it did not sufficiently cover the whole area. As far as I know, all families have received advantages from UXO clearance. UXO teams were friendly; they informed us about the safety and did not let us in the area while clearance was in progress (FF5, interview, June 20, 2014).

Another respondent added that he was happy with the clearance, but not 100% satisfied because he had found two bombies in his UXO cleared garden. He expressed that:

I was happy that UXO teams came to clear the land around here. I can trust my children going out to look for food without hitting UXO. I am also satisfied to some extent because it is not as risky as before when digging the ground to plant trees or grow crops in my garden. However, I am not 100% satisfied because I still have found some UXOs in my garden. If I have to rate the thoroughness of the clearance, I would give it 80-90% because things were left behind. It is not 100% UXO cleared. Maybe, they did not find all the UXOs because the small creek in my garden had water running at the time. I found two bombies in the creek when the water dried up. I did not know if UXO teams have cleared along the creek when there was water. The detectors they used may not work in a place with water (MF3, interview, July 2, 2014).

However, one interviewee said although he had not found a single UXO item on his land, he was still somehow worried due to his experience of hearing a story from the UXO teams’ discussion on one occasion. He explained the situation as below:

I am worried that there would be more UXOs left around the village vicinity because one day I went out with the NTPC team and heard a story. They said that one UXO team had gone through that area before. The Zimbabwean team! They cleared the area before. They were arguing about something. Later, another team, I think they
wore a grey uniform, went through that area again and found something. It is not small, but a big bomb. I heard from the conversation that the first team may have been accused and that someone placed the bomb there, but the state of the bomb did not look like it was just placed over there because it was covered with some twisted tree roots. This is why I think there could be some UXOs left behind (MF2, interview, June 30, 2014).

In addition, in terms of coverage, most participants said that the clearance did not cover all areas that may have had UXOs. Some pointed out that UXO teams only cleared where the NTPC assigned them to do so. One of them commented that:

*It was good that they came and cleared the land around the village, but it was not good enough because they did not clear every family’s land. They only cleared the land covered by NTPC projects* (TD9, interview, July 5, 2014).

Although satisfied with the thoroughness of the clearance, one informant pointed out that UXO clearance also brought some negative consequences to some of the villagers. He explained that upon seeing the UXO teams using detectors searching for UXOs and all other kinds of metal, some villagers went to buy counterfeit detectors in order to use them to search for pieces of UXO fragments. Fortunately, those people who brought in the fake detectors did not have a chance to use them because the local police found out and kept all the fake detectors at the police station. The respondent said:

*Initially, for two to three years during the presence of the UXO teams, some people saw how UXO teams used detectors to search for UXOs and metal. These people went to buy fake Chinese detectors which were very cheap and did not meet the standards. They also had no experience or knowledge about how to deal with UXOs. They understood that using detectors (the fake ones) would help them get a lot of UXO fragments. However, these people did not have a chance to use the artificial detectors because the local police found out and seized all the detectors and kept them in a police store* (VC10, interview, June 22, 2014).

Based on the responses of participants, the thoroughness of the UXO clearance was generally good. The majority of them maintained that they had not found any UXO on their cleared land and thus described the clearance thoroughness as ‘good’. The two interviewees who had come across some UXO items on their land were also generally satisfied with the clearance and so one of them scored the clearance 80-90%, while another rated 99%. However, one
informant felt uncertain whether or not there would be UXO left in the cleared area as his experience of hearing a story made him worried. Most of the participants did not seem to be satisfied with the clearance coverage. Some respondents claimed that UXO operators only performed the clearance task in places assigned by NTPC.

Likewise, one participant believed that the UXO operators had also brought about a negative consequence to some of the villagers. He explained that seeing UXO teams using the detectors searching for UXO and metal convinced some people to bring in detectors, which he described as ‘fake, artificial, and did not meet the standards’. He also pointed out that those who had brought in the fake detectors did not have skills to deal with UXO. As a result, this could have led to an UXO accident if they had had the chance to use the devices.

4.12. The need for further UXO clearance

Given that there was not 100% satisfaction about the clearance coverage, 10 out of the 11 participants said that they wanted to see further UXO clearance in the village. They said many more places around the village have not been UXO cleared, particularly where villagers go to look for forest products. However, three respondents said that there should not be a lot of UXOs left in the village area. As one of them said:

UXO team should come back and work here again to clear areas that have not yet been cleared. I have not found any UXO since they left, but I am still worried about where people go to find food. It is safe where they have cleared and that made me feel comfortable when digging the ground. However, across the creek where it has not been cleared, I found one UXO when I tried to clean up the garden. My husband reported it to the UXO teams and they came to destroy it (FF4, interview, June 18, 2014).

Among the 10 participants, two of them claimed that they wanted UXO clearance to be undertaken in their cleared land because they had found live UXO items. They said that UXOs which the teams had missed might be buried deep under the ground and when the rain carried away the soil, UXOs might appear on the surface. As one of them explained:

I want UXO operators to re-enter the village because sometimes UXOs are buried deeply under the ground. When it rains and the soil erodes, UXOs can be up on the surface again. One time clearance may not take out every single item. I want them to re-clear my garden, if possible. The first clearance is good, but I am worried there
would be more UXOs buried deep in the ground and they could show up when the soil erodes (MF1, interview, June 29, 2014).

Meanwhile, another informant commented that further clearance should occur because some part of her garden has not been UXO cleared as it was not covered by the NTPC project. She said:

There should be further clearance if possible because half of my garden has not been cleared (TD9, interview, July 5, 2014).

From a different point of view, one interviewee said that further clearance may not be necessary because he did not think there would be many UXOs left in the area. He further argued that many places had been flooded by the reservoir and even if there are a lot of UXOs, they would not pose a threat to people. He commented that:

I do not think there are many UXOs left in this surrounding area. Many places that people used to go and find food have been flooded. There may be a lot of UXOs under the water. Along the road No 8, there were plenty of UXOs before, but it all has been cleared, so there should not be many left now (MP7, interview, June 24, 2014).

Surprisingly, although one respondent said there should be further clearance, he realised that it would not be possible to clear everywhere required by villagers. He was aware that the concerned organisations would not have enough money to complete the tasks. He expressed that:

Quite a few places around the village have not been cleared. If possible, UXO teams should clear where people often go to find food such as in the valleys and along the forests nearby here. However, I understand that the government or concerned organisations may not have enough capital to organise such a task, but my desire is that an UXO team should be based here (RF11, interview, June 23, 2014).

It is worth noting that most of the respondents said UXO operational tasks should be ongoing and should cover wider areas, while others said it depended on the UXO operators’ policy. As one of them explained:

To make the operations more effective, it depends on the UXO team working system, but I think they have to clear more areas in the village vicinity. They were here to
clear only the land covered by NTPC project. They should have cleared other places not included in the project too because I am sure that villagers will expand their gardens and rice fields in the future. The RE team did a very good job I think because they helped children to understand about UXO danger and since then I have not heard of any UXO accident around here. However, maybe they should do this activity more often so that all the people in the village would have a chance to join the event (FF4, interview, June 18, 2014).

One informant described how UXO operations should be treated like ‘study or soup’. She explained this in the following terms:

We need more UXO activities to happen in the village, although the team did well in the past we still have new generations to come and we need them to gain the knowledge. It is like studying. This year you are in grade 2 and next year in grade 3, 4, 5, 6, 7. It’s also like cooked soup, if you do not heat it up, it will go rotten (FF5, interview, June 20, 2014).

Another respondent expressed that reports of UXO should be responded to faster. He said:

I think it was a bit slow. For example, when they found UXOs, they normally marked them off with sticks and they left the things there for a few days before they came to destroy them. I do not know if they did the same thing elsewhere, but that was what happened when they came and cleared my land. Marking may be good enough to warn adults, but I do not think it was good enough to warn children. Sometimes it took them 2-3 days or sometimes more until they found many of the UXOs before they came to dispose them. This is what I saw as their weakness. When they marked and if children saw them, they could be curious and want to go near or even play with the objects (RF11, interview, June 23, 2014).

From another perspective, one respondent commented that UXO clearance should be performed in the dry season so that UXOs in the creek can be detected when there is no water. He also added that the RE team ought to come back and do the task again because he had not had a chance to join the sessions and he believed that he was not the only one in the village who had not participated in the event. He suggested that:

If possible, the UXO team should come back here and clear along the creek in the dry season when there is no water. I am sure there are still plenty of UXOs

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somewhere. I also want RE team to come here because I have never joined them. I did not know whether they had come here, but I did not see that. I believe that it’s not only me who did not know RE team had come here. I also believe that there are many more UXOs somewhere inside and outside my garden vicinity (MF3, interview, July 2, 2014).

Another participant added that detectors used by the UXO operators should be ones that can detect objects buried deep under the ground. He commented that:

_I think there should be different kinds of detectors that can detect deeper in the ground. Maybe their detectors could not search deep enough and UXOs buried very deeply could not be detected_ (MF2, interview, June 30, 2014).

Although generally satisfied with the UXO operations in the village, about half of the respondents could identify some weaknesses of the operations, which could have been addressed. Therefore, they shared some thoughts which they believed could help improve the UXO operational tasks. Some said it depended on the operators’ policy, while others said the clearance should cover more areas and suggested RE to be an ongoing activity so that everyone could have a chance to attend. Some suggested that when villagers report UXOs found, the teams should respond to the report faster, while others recommended the teams use detectors that can detect deeper.

4.13. Risk education effectiveness (knowledge about UXO awareness)

Based on participants’ responses, RE activity had occurred once or twice in the village when the UXO teams were in the area between 2005 and 2009. All participants who had attended the risk education sessions agreed that the UXO teams did a very good job in terms of RE provision. Respondents’ recall of the RE lessons and the safety record in the area proved that RE activity has significantly contributed to the safety environment in the village. They also said that they had explained the risks to their children when they returned home from the sessions. As one of them said:

_The risk education team also did a good job as the team came to provide safety knowledge to villagers quite often. They warned us not to dig the ground carelessly, we must use shovels instead of hoes. They also told us to tell our children as well_ (FF5, interview, June 20, 2014).
Among the 11 participants, nine said they had attended the RE sessions one or more times and, surprisingly, they could all still remember what had been said in the sessions. One of them maintained that:

*I also joined RE sessions a few times when they organised them in the village office and school. It was great that most adults and children in the village joined the event. They announced that if anyone saw any suspicious item, do not touch, mark with sticks, and report to the team or village chief. They also used a big poster with pictures of bombs and bombies. They said to be careful when digging the ground and we had to use shovels instead of hoes* (TC8, interview, June 26, 2014).

Despite positive feedback regarding the RE activity, two of the 11 interviewees said that they had not joined the session. They said they had not known there was this kind of activity happening in the village, but reported that they had seen the UXO clearance team working in the location. One of them explained that:

*I never joined a RE session because I did not see and did not know whether they came here to do that, but I saw UXO clearance team around this area* (MF3, interview, July 2, 2014).

In addition, the two respondents who had found UXOs on their land said they had moved the items because they did not want the children to see and play with the objects. As one of them said:

*The UXO in my garden was found by my daughter when she dug the ground to plant cassava and she hit it with shovel. Luckily it did not explode. I had no choice and was afraid children would find it and play with it so I moved it somewhere outside my garden and marked with some stick* (MF1, interview, June 29, 2014).

The respondent further said that he once had attempted to cut the UXO apart with a hacksaw in order to use the part as a pounding mortar. He said:
There was also a tube, a long tube about 1 meter. The tail was empty, but its head still looked dangerous. I heard it was reported to the village chief, but nothing had been done about it, so someone just placed it against the fence and it was there for about 4-5 months. I was curious so I went to buy a hacksaw and tried to cut the tube apart, threw the head away and used the empty tail part as a pounding mortar (MF1, interview, June 29, 2014)

Figure 17: A UXO tube-made pounding facility. Photo by Chanthavong (2014)

The respondents who had attended the RE sessions could still remember relatively well the lessons in terms of theory. Many said the sessions included playing games, drawing pictures, a puppet show, and other performances relating to the UXO awareness activity. They knew what they should do upon finding UXO-suspected items. They remembered the marking and reporting methods. The sessions had also convinced them to use the proper tools such as ‘shovels’ instead of ‘hoes’ when performing agricultural activities. Nevertheless, in terms of practice, one respondent reported that he had moved an UXO item even though he had attended the RE sessions. He said he did so because he was afraid children would find out and might play with the object. In addition, another informant who had not joined the RE sessions had also moved the UXOs found in his garden.


Although the respondents were complimentary about the RE activity, most of them commented that the sessions should be continuously provided to villagers, especially to children. They said new generations are growing up and they would need to be instructed about the UXO hazard. Therefore, most participants thought that further RE activity should be provided.

Regarding this point, to be honest, it is still not enough because there are many places in Nakai area that could be full of UXOs. To say ‘enough’ is not the right thing because new generations are coming along and I am sure they need to be
instructed about UXO danger. We still have many more generations to come (FF5, interview, June 20, 2014).

The view is highlighted by another respondent who said that new generations who just grew up after the presence of the UXO teams would need proper instructions about UXO danger. He said:

*I really want the UXO team to come back and do this again because children born after the team left the area will need to be informed about the UXO awareness. They will not listen when their parents tell them. What parents say will not be as effective as what the UXO team tell them. Some of the children may ask where their parents get the lessons from and because of this they may not listen to their parents* (MF1, interview, June 29, 2014).

However, one interviewee said that further RE did not have to happen again from the UXO team. She pointed out that children could be taught about this in school. She expressed that:

*For RE, I do not think it is necessary because people already knew how dangerous UXO could be and they knew how to avoid such danger. For children, maybe teachers at school can tell students from time to time. Although I want more UXO clearance, I believe there are not many UXOs left now in this area, so further RE may not be necessary. It is good to have more RE sessions, but it is also fine not to have more* (TC8, interview, June 26, 2014).

Although RE activity has positive feedback from most of the respondents, further sessions are believed to be vital. Many of them said RE should be an on-going activity so that new generations who just grew up and missed the chance could attend the sessions. ‘New generations’ needing to perceive the knowledge about UXO awareness seems to be the main focus of most of the respondents. Some argued that parents could literally teach their children, but said it would not be as effective as the RE team. In fact, an adult who had attended the RE sessions still appeared to be moving UXO items because he was worried that children would find and play with such objects. In addition, two of the interviewees had not joined the RE session at all and this implies a few theories: they did not know RE was in the village; they knew but did not want to attend the session on purpose; or advance notice about RE activity was not broadly disseminated by the team and so not all villagers at risk knew about it.
In addition, participants’ understanding about RE can be divided into two topics: theory and practice. In theory, the respondents who had attended the RE sessions understood well about the UXO awareness. In practice, some participant felt unable to follow the RE instructions due to the need to protect children from harm.

4.15. Concerns over the future of the village agriculture

Despite the land being cleared of UXO, all respondents were in agreement that NTPC has played a significant role in the agriculture sector of the village. However, the NTPC agriculture promotional projects are going to end in 2014. Hence, most of them are worried that they might face difficulties in terms of agriculture. Some informants said villagers may stop doing what they have been doing. Some said some people may just do whatever they want in their old traditional ways. As one of them said:

_NTPC team and some government officials have come here to lead villagers to do all kinds of agricultural activities. They supported villagers with many things including plants and seeds such as mango trees, jack fruit trees, vegetable seeds, and a lot more. They also provided fertilizers and taught villagers how to make bio-fertilizers. These are very good for people here. However, the projects are ending this year. When this is over, I think villagers will just do whatever they want in their own ways and they will face a lot of difficulties. They will do things without plans and proper management. They will do things in their old traditional ways_ (VC10, interview, June 22, 2014).

Because the NTPC support has contributed a great deal to the village agriculture, when acknowledging that the NTPC is leaving, most of the respondents thought that other agricultural development projects’ interventions would help maintain the village agricultural conditions and assist them to get the most out of the UXO cleared land. This is because some respondents said that they still needed to gain agricultural knowledge and skills. As one of them expressed:

_To make the cleared land more productive, concerned agricultural organisations should come and help villagers and provide them with agricultural techniques. Without someone to lead, many of them will just leave the land empty and try to work in a new place because the quality of the soil in the old place will not be suitable to grow crops_ (TD9, interview, July 5, 2014).
Conversely, three respondents contended that having concerned organisations enter the area might not be a solution to the agricultural problem because their explanations showed that even with strong support from the NTPC, many families seemed to ignore the assistance and did what they wanted to do instead. One of them commented that:

\[ I \text{ do not understand these people (villagers). NTPC project teams have provided a lot of support, but they still do not work hard enough to make their land productive. They provided seeds and I also got pineapple sprouts. They also gave villagers fruit trees and other kinds of cash crops, but many people still did not want to do it, so I do not really know what else is supposed to be done} \text{ (MP7, interview, June 24, 2014).} \]

Likewise, two participants maintained that some people did not pay much attention to the lead of the NTPC regarding agriculture. They focused on other businesses instead, including illegal logging.

\[ \text{Villagers have been supported by NTPC projects regarding agriculture. They even provided many kinds of plants and fertilizer, but it was because of the people here. They did not pay much attention on this issue. Some of them illegally deal with logging and some get rich while some get arrested. This is one of the reasons many families did not focus enough on the cleared land} \text{ (RF11, interview, June 23, 2014).} \]

Meanwhile, one interviewee said that he had had proper agricultural lessons from the NTPC that could keep him busy with his work. As a consequence, the intervention of other concerned organisations may not be necessary for him. He said:

\[ \text{NTPC project staff came and provided agricultural training and gave me lessons on how to make bio-fertilizer. Without training, I do not think these activities would have happened, but I am not sure about this...[laughing...]. To me, it should be fine whether there should be new projects coming in. I will still have lessons provided by NTPC so I can keep doing what I do. I have my children and grandchildren who are growing up every day. If I do not do it, what am I and my family supposed to eat?} \text{ (MF1, interview, June 29, 2014).} \]

Based on the participants’ feedback, the NTPC agricultural projects have had a significant influence on the existence of the village agricultural activities. As a result, most of the respondents were concerned about the NTPC’s departure at the end of the year. They
predicted that the future of the village agriculture would face ‘difficulties’. Some said many people might return to the traditional practices, such as slash-and-burn cultivation, unless they are rich. As a result, many of the respondents said that other concerned organisations’ interventions are required in order to provide villagers with agricultural techniques.

However, some respondents did not seem to agree with this notion. They argued that the problem was a result of some villagers not trying hard enough even with a lot of support from the NTPC. Some even said some villagers focused on other businesses, which some referred to as illegal logging. Meanwhile, another participant said concerned organisations may not be necessary because he thought what the NTPC had provided was good enough for him to maintain his agricultural activities.

4.16. Summary

This chapter presented findings of the data gathered from the semi-structured interviews. It is revealed that, although the research involved a range of participants in terms of age groups, genders, and occupations, all the respondents have engaged in one or another subsistence farming practice. As a result, different groups did not seem to provide a lot of different answers to the research questions. In addition, a number of interesting aspects concerning the UXO operations have emerged through the process of data analysis. These aspects are further discussed and analysed in the following chapter through the themes and integration of the literature addressed in Chapter Two.
INTRODUCTION

The last chapter presented findings from the data in accordance with participants’ answers to the semi-structured interview questions. This chapter provides the discussion and analysis of the findings through themes emerging from the interviews. The key findings are critically analysed in the context of the literature addressed in Chapter Two. The chapter also presents suggestions and recommendations in accordance with the research findings.

5.1. Major changes after the UXO operational intervention

From the participants’ perspectives, there had been a number of significant changes since the introduction of the UXO operations including safety, convenience, and the opportunity for development, especially agricultural development. These are in line with the literature that stated UXO operations serve as a multiplier for fundamental development, communities are able to access agricultural land without fear of UXO, children can play safely, and basic infrastructure can be built (Cambodia Mine Action Centre, 2012; CARE Australia, 2010, 2013; Durham et al., 2011; Mines Advisory Group, 2009; United Nations Development Programme, 2012). In this study, participants could identify changes at different levels depending on their experience of engaging in village activities and knowledge about the UXO issues. For instance, the village chief and a former village chief explained the changes in more detail; while others, particularly the female participants, could identify fewer changes. However, all participants’ explanations showed that there had been several changes in the village after the UXO operations.

5.1.1. Safety

The most obvious finding to emerge from the analysis is that the intervention of the UXO operations had significantly maximised the safety of people in the village. All participants said that it was safe when they worked on the ground in gardens and paddy fields. They also felt safe when digging for food such as crickets and crabs because they believed that they would no longer hit UXOs. More importantly, children could freely dig for earthworms for fishing and parents did not have to be concerned that their children would play with the deadly UXO. These findings are backed up by the Mines Advisory Group (2006), which
stated that UXO operations have provided safe environments for the affected communities. This study also reveals that there had not been any UXO-related accidents and this proved that UXO operations have brought about spectacular safety. The increase in safety is highlighted in the literature in which it is stated that the number of casualties resulting from UXO accidents throughout Laos continued to decline from 56 in 2012 to 41 victims in 2013 (National Regulatory Authority, 2014). However, the literature is unclear as to whether casualties occurred on the pre- or post-cleared area. In comparison to the case in Afghanistan, the post-clearance survey found that no UXO casualties had been reported after the clearance (Paterson et al., 2013). This finding is in line with the results of this study. Although some respondents are still finding some UXO items, they felt safer in themselves and more confident about their family members as clearance and RE activities had provided them with the awareness about the UXO danger. This finding is consistent with MAG’s report on UXO post-clearance assessment in Laos which stated that 94% of respondents felt great safety for their family (Mines Advisory Group, 2009).

Furthermore, UXO clearance had also made it more convenient for people to work the ground. They no longer felt scared and had more confidence when digging the ground both for food and agricultural activities. This finding is backed up by Paterson et al. (2013) who stated that people in the Ala Chapan community, Afghanistan, have had greater confidence in working on the ground after the UXO clearance and the area cleared was also quickly used for multiple purposes. The study herein also found that the term ‘convenience’ meant that respondents had more freedom to work and that they could work faster than before since they no longer had to worry about hitting UXO hidden under the ground surface.

### 5.1.2. Opportunity for development

It is not surprising to note that UXO clearance has given respondents the opportunity for agricultural development. This is because agricultural land is classified as the priority/high value land for UXO clearance in Laos (GICHD, 2014). The findings indicate that all participants have more and safer land for agricultural purposes. Many of the participants said that without UXO clearance, their land would have been left uncultivated. As mentioned in the literature, UXO presence had prevented communities from accessing their agricultural land (Durham & Ali, 2008; Howe & Sims, 2011; Jaenig, 2010; Khamvongsa & Russell, 2009) and had resulted in a shortage of domestic food products as farmers had not been able to fully use the farming land (Madhavi, 2008; McGrath, 2000). This point is also consistent with the report from CARE Australia (2010), which indicated that previous UXO presence
had limited the amount of land villagers had and in turn affected the amount of food they could grow to feed their family.

The findings further reveal that UXO clearance had paved the way for fundamental developmental projects to enter the area to build basic infrastructure systems including a school, a groundwater hand pump, and a road. These findings are supported by the report from UXO LAO (2012), which suggested that its cooperation with other developmental organisations has enabled basic infrastructure construction to happen including an irrigation system, a school, healthcare, and a water supply. Similarly, the assessment report from CARE Australia (2010) also declared that with the land free from UXO, a new water system was installed in this same area. As a result, villagers have had clean water to use and the standard of living has improved.

Figure 18: (L) a groundwater hand pump. Photo by: Chanthavong (2014); (R) a new primary school (Sacklokham, Kouangpalath, & Kousonsavath, 2014)

5.2. Diversification of farming

According to all participants, agricultural land could be accessed and they all agreed that they have grown more plants and crops than in the past. Most of them said that they have enough rice and vegetables for eating. The finding is consistent with the report from the Mines Advisory Group (2012b) which stated that, in one of the villages in Buttambang province, Cambodia, prior to the intervention of MAG, villagers had been struggling on a small piece of land and could not grow enough crops to feed the family. After MAG’s operations in the area, villagers in the community were buzzing with farming activities such as planting sugarcane, corn, banana trees, and other kinds of crops on the land cleared by MAG. Some respondents said they did not have to go to the market to buy some kinds of vegetables because they could grow them on their own land. This means that UXO operations have had
a substantial impact on agricultural activities. Participants also said that they all had stopped practising shifting slash-and-burn cultivation and were focused on paddy fields. This finding is in line with the government’s statement in the 6th NSED in which it said reducing the slash-and-burn practice is one of its main objectives (Ministry of Planning and Investment, 2006).

The findings also revealed that most of the participants attempted to compare the agricultural situations before and after the UXO clearance. They all reported that they had been very worried that they would hit the UXO when working on the ground in the past, but they now had no concerns because they knew the ground was safe. Not surprisingly, one finding reveals that the UXO threat had slowed participants down when they performed agricultural activities in the past. As a result, they produced fewer products and could not afford to feed family members. Since the clearance, most of them agreed that their living conditions have improved because their agricultural land could be accessed, enabling them to grow rice and crops for eating and for economic purposes. This finding is highlighted by a media release called *Improving life through UXO clearance* from CARE Australia (2013) stating that, since 2007, it has worked with over 2,500 families in 19 villages in Sekong province, southern Laos. The media release further stated that, with over 97 hectares of UXO cleared land (over 2,500 UXO items disposed), CARE has supported villagers as they sought to improve their livelihoods through cash crop planting, such as coffee, and building fish ponds.

Another interesting finding is that some of the participants had tried to work on the UXO-contaminated land, but they had to cease because they found or hit the UXOs. This point is aligned with Baird and Billion (2012), Howe and Sims (2011), McGrath (2000), and Osterlind (2008) all of whom stated that UXO presence has undermined livelihood safety and made affected communities’ day-to-day life difficult.

It was interesting to discover that some respondents reported they have not used the UXO cleared land because they said they lacked facilities to deal with the tasks. Based on the participants, the reasons behind the cleared land negligence are as follows:

- A lack of money to pay for a bulldozer to level the land
- Insufficient labour to work on the land and put up fences against cattle
- The land quality is not good after growing crops on it for the first few years
- A lack of proper agricultural knowledge and skills
Wealth and impoverishment all affected the agricultural activities. For instance, if the families were better-off, they could pay for the work to be done on their land, such as paying for the bulldozer to level the land; but those who were poor, are likely to leave the land uncultivated because they cannot afford to pay for the bulldozer for levelling the land or to buy proper agricultural tools to use in the tasks.

These findings reinforce those of the study carried out by Phonepraseuth (2012) which found that many of the resettled households expressed their concerns about securing their livelihoods. These concerns included the lack of a labour force, a lack of capability such as necessary skills and knowledge, a lack of soil quality for agricultural purposes and concern over food security.

5.3. Land ownership and redistribution

One of the most interesting findings is that not all the respondents had received the 0.66 hectare UXO cleared land as a result of the resettlement. It is revealed that those who did not get land in this way had moved to the area prior to the start of the resettlement programme and so it was believed that they had not been affected by the hydropower project. However, the respondents who had not received the land had been also included in the UXO operations. These findings indicate that land titling was a major issue in Lao rural areas. As mentioned in the literature, the land titling and land allocation problem in Laos has long been identified, but has not been resolved, and the war and development have also added to this issue (Baird & Shoemaker, 2007; Friederichsen & Neef, 2010; Howe & Sims, 2011).

Another significant finding is that some respondents complained that they needed more land space as the area provided by the NTPC is not enough to grow rice or crops to feed their family members. This finding is also highlighted in the study conducted in the same area by (Phonepraseuth, 2012). He reported that most of the total 43 respondents across five resettled villages, particularly families with a large number of people, complained that they could not produce sufficient food out of the 0.66 hectare of land, and this issue was described as one of the biggest challenges to have resulted from the resettlement programme. Some respondents in the study herein said they wanted to expand their land for business purposes, but they could not get more land. They further stated that even if the land had not been UXO cleared, they would still have tried to use the land. This finding is supported by the literature which points out that some families ignored the UXO danger because working on the ground is only one of a very few options (Moyes et al., 2002). Wyper (2012) described these circumstances
as ‘enforced risk taking’ because if UXO-affected communities do not risk their lives working on the contaminated land, they may have to live with chronic malnutrition or in acute poverty.

Another finding of this research study is that some families were handed another piece of land (0.2 hectare) known as irrigational land. However, based on the village chief’s comments, the mapping system of this piece of land is so complicated that villagers are not sure where their land borders are. The literature stated that land issues, including mapping in Laos, have long been recognised as problematic, but have never been resolved (Friederichsen & Neef, 2010). Baird and Shoemaker (2007), McDowell et al. (2012), and Vandergeest (2003) also stated that most cultivating land owners did not possess official land tenure certificates and the land ownership was dependent on village-based institutions, causing problems for the land allocation and land titling. This has meant that some families have been hesitant about growing rice or crops on this piece of land because they were afraid they would use other people’s land.

The research findings herein show that villagers still have issues with the land and so continue to confront difficulties in the new environment. As mentioned in the literature, the war and its legacy have caused insecurities in relation to land tenure in many dramatic ways because UXOs have made the land inaccessible and constrained development (Baird & Billion, 2012). In many cases, developmental projects have pushed people into an UXO-contaminated area, which exposes them to more risk, as well as causing extra UXO operational expense for the developmental organisations (Howe & Sims, 2011). For example, in Nakai, the NTPC spent over USD16.7 to cover the cost of UXO operations (Mine Action Canada, 2009). Even so, some villagers still complained that they did not have enough land to grow rice and crops to feed their family members (Howe & Sims, 2011). However, with the support of The World Bank & Asian Development Bank (2011), the NTPC had provided all resettlement villages with a broad ranging assistance package including household infrastructure, community infrastructure, and livelihood programmes which they insisted provides compensation far beyond what villagers lost due to the dam project. However, the NTPC stated that it remains challenging for villagers attempting to adapt to the new environment, to cope with the changing socio-economic context, and to pursue opportunities and benefit from the advantages of the new livelihood system (Nam Theun 2 Power Company, 2013b).
5.4. Household economic conditions

In relation to the family economy, as a consequence of the UXO clearance all participants agreed that since they have had safe land, they have been able to grow rice and several kinds of crops. Some said they had turned the land into a business by growing cash crops for sale in the local market. These findings show that UXO clearance has played a crucial role in assisting respondents to improve their families’ living conditions. As stated by CARE Australia (2010), the UXO operations have provided affected communities better access to resources needed to earn a living and they have more freedom to expand their agricultural activities, such as growing cash crops as a means of income generation. The findings are also in line with the literature which found that UXO clearance has assisted communities to practise subsistence farming activities without fear, while schools, water points, and local healthcare centres can be constructed. Together, these enable communities to meet their basic needs (Mines Advisory Group, 2009, 2012b).

The findings also illustrate that the NTPC’s assistance has greatly contributed to the improvement of participants’ living conditions. The NTPC leadership in the agricultural sector has provided valuable lessons, which many families have utilised to sustain their agricultural activities. As stated in the The World Bank & Asian Development Bank (2010) literature, the NTPC livelihood programme - including agricultural projects such as providing seeds and seedlings, fertilizer, tools, and skills have facilitated villagers’ capabilities to arrange their livelihoods in a much more efficient manner. This clearly indicates that UXO clearance alone may not be able to help affected communities improve their living conditions unless there is intervention from other developmental organisations. Durham et al. (2011) maintained, at the time of writing, that there had not been adequate evidence to demonstrate that UXO clearance contributed to the recovery of post-conflict community livelihoods. However, based on the United Nations Development Programme (2012) report, although it does not guarantee that addressing the UXO problem alone can directly help to improve access to services, increase income or ensure food security, UXO action is regarded as a prerequisite and an essential multiplier for overall development and improvements of the rural UXO-contaminated areas. Meanwhile, McGrath (2000) suggested that the UXO operators and developmental organisations strengthen their partnerships so that the land cleared gives the most benefit to affected communities. In this sense, the result of cooperation between the NTPC and the UXO operators has shown that villagers have gained benefits in multiple ways including agriculture, the socio-economy, and development.
5.5. Improved food security

Based on the interviews, subsistence farming and bush products are the main sources of food generation for the participants. The respondents said that they could get access to safer and more food sources after the UXO clearance. In addition, having more safe land spaces enabled them to grow more vegetables and rice as a means of food and for selling to get some money to buy food ingredients such as salt, MSG, and other kinds of food condiments. These findings match the results of a study conducted by Durham and Ali (2008) which found that people were exposed to better food sources such as vegetables. In the study herein, the findings also reveal that many of the participants did not have to buy certain kinds of vegetables as they could grow them on their own land. Likewise, one respondent said that she had built a fish pond near her house. These findings suggest that UXO operations have helped respondents to access more food sources, producing sufficient food sufficiency for their family. As stated by CARE Australia (2010) and Durham et al. (2011), UXO clearance has provided safe land spaces for growing crops, breeding livestock, and building fish ponds, which means people have more food options both to consume and to sell for extra income.

Forest products are essential sources of food, income, and other kinds of material input to support the livelihoods of individuals living in the forest adjacent areas (Arnold & Perez, 1998; Jensen, 2009). In Nakai, besides the subsistence agriculture, livestock, and hunting, villagers were heavily dependent on forest products as sources of food (McDowell et al., 2012; Phonepraseuth, 2012; Robichaud, 2013). However, the UXO presence hindered the sense of security for villagers when they searched for the forest products (Howe & Sims, 2011; McDowell et al., 2012). Interestingly, one finding of this study shows participants could now access the forest products more freely in the UXO cleared areas. They said they had no worries about UXOs when going into the jungle to find food such as bamboo shoots, mushrooms, and other kinds of bush vegetables. They had no concerns when digging the ground for crabs and crickets, and children had more freedom to dig for earthworms for fishing.

5.6. Gender difference in attitudes towards UXO issues

Despite focusing on different groups of people in terms of ages, genders, and occupations, this study found that all participants engaged in one or another subsistence agricultural activity. As mentioned in the literature, the majority of the Lao population lives in remote areas and mainly base their living on subsistence farming (International Labour Organisation, 2011; Madhavi, 2008). Even a trader, a river fisherman, and a teacher all partially perform
subsistence agriculture. However, this study detected some slight differences in perception between men and women participants, as discussed below.

In spite of their shyness, all female respondents had participated in the RE activity while two of the male respondents did not mention this in the interviews. Women tended to carry the psychological burden for family members, while men tended to focus on agriculture. For instance, when asked about UXO issues in general, women would explain the degree of their concern by saying that they were worried that their children would play with UXOs, and that their husbands and people they know would be involved in an accident. This finding matches the results of a study carried out by MACCA in Afghanistan, which revealed that, although women were exposed to a lower risk of UXO, they carried a greater psychological burden (Paterson et al., 2013). In fact, a study by Osterlind (2008) also found that UXO issues correlated to the respective physical and psychological aspects of men and women. Paterson et al. (2013) further indicated that adult men and children received RE more often than did adult women. In the current study, to the contrary, more women had received RE than men as all female participants reported that they had taken part in the activity, while two men participants reported that they had not known about the sessions. This finding indicates that, although the literature suggested that fewer women are involved in the UXO risk activities and accidents when compared to men and children (Boddington & Chanthavongsa, 2010; Durham & Ali, 2008; Moyes et al., 2002; Wyper, 2012), they are more active in the participation of the risk awareness activities.

Meanwhile, men focused more on the issues that affected their agricultural activities when asked about UXO issues. They explained how UXO presence had stopped them from using the land. Some said they were afraid of UXOs, but had to move the objects for agricultural purposes and for the safety of children. Interestingly, only male participants were found to have moved UXOs. Moreover, men, especially the older men, seemed to know more about the war situation in the location and so they often had a long story to tell. However, the research questions were not designed to gain knowledge about the war, but the consequences of UXO operations for the living conditions and safety of the villagers.

5.7. The state of relationships with partners, children, relatives, neighbours, and other villagers

Based on the participants’ comments, UXO operations have contributed a great deal to the state of their relationships. The findings show that participants are now living without the fear
of UXO. They are no longer concerned that their children will hit UXOs when they play around the area. As a consequence, parents can live happily while children can play without danger from UXOs. Thus it can be said that UXO operations have improved the psychological state of the villagers. This finding matches the result of the survey carried out by MACCA in Afghanistan, which showed that UXO/mine action has not only provided safe land for agricultural and economic purposes, but also has made people in the community both physically and psychologically safe (Paterson et al., 2013). However, the literature noted that there has not been a study to assess the psychological state of individuals living in the UXO-contaminated areas. One finding of the current study indicates that instead of talking about UXO issues, participants now talked to their children about studies and this has made the atmosphere within the family, as well as in the village more joyful. Another interesting finding is that UXO teams have brought about togetherness because villagers had more opportunities to share their thoughts about the UXO issue and discuss how problems can be avoided. This finding is in line with Durham et al. (2011) study carried out in Khammouane province as it found that villagers participated more in the social events and visited friends and neighbours outside their own communities.

The findings also demonstrate that participants have had more joyful relationships with their neighbouring villagers. This point is supported by Steuer and Marks (2008), who stated that well-being is achieved not only from the actions of people, but also from relationships with others and a host of collective goods. One of the most interesting findings is that villagers now do not have to argue with their neighbours about land invasions. In the past, they said they sometimes mistakenly invaded the land that belonged to another village, and they ended up fighting. Most respondents agreed that they had enough safe land for agricultural activities. As a consequence, they no longer have to fight for land as shifting agricultural practice no longer existed in the village. Subsequently, friendships between neighbours have been tightened. These findings are in line with some of the seven most influential factors of well-being, including family relationships, community and friends, and personal freedom (Hothi et al., n.d). In this sense, the UXO operations have helped villagers to be happy in their family relationships and in those with their neighbours; villagers are more sociable which in turn means they have better friendships.

5.8. Improved transport infrastructure

One important finding is that UXO clearance has made it possible for the construction of basic infrastructure systems. If UXOs were found, road construction, for example, was often
cancelled or delayed until the clearance was undertaken. This issue was highlighted in the literature; implementation of development projects and basic infrastructure, including road construction, had to be postponed until extra expenditure was available for the UXO clearance (Boddington & Chanthavongsa, 2010; Howe & Sims, 2011; United Nations Development Programme, 2009). This finding of the current research suggests that UXO clearance plays a crucial role in the fundamental development process of the UXO affected areas.

The findings also show that respondents were no longer worried about kicking or stamping on UXOs when they walked around the area. Roads connecting village to village, which before were full of UXOs, are now UXO free. The findings indicate that the road conditions now have made transport in the area easy and villagers can get to destinations faster because vehicles can easily pass through. This point is aligned with the Cambodia Mine Action Centre (2013) report, which demonstrated that UXO/mine operations have made it possible for the construction of the roads that link place to place and countryside to town. These findings suggest that UXO clearance not only provides safety, but also a safe path for basic infrastructure systems, including roads. Consequently, it is convenient for commuters in the communities.

5.9. Unexploded ordnance-related accidents, deaths, and injuries

It is somewhat surprising to find that, in Laos, there have been only a few studies to assess whether or not there is any UXO-related accident happening in places where UXO operations have been undertaken. The study carried out by Phasavaeng (2011) in Sekong, southern Laos, showed that the number of casualties remained high in the first four years into the land clearance and RE, but after year four, the number of casualties sharply declined. However, the study did not indicate whether or not the casualties came from places where UXO operations were carried out. In Afghanistan, the post-clearance survey conducted by MACCA indicated that no UXO/mine casualty was reported in a place where clearance had been carried out (Paterson et al., 2013). MACCA’s finding matches the result of this study as it found that, since the intervention of the UXO operations, there had not been any UXO-related accident (no casualty) in the village. In fact, all participants said that they had not even heard of an accident in the whole community of 17 villages in Nakai. Figure 19 shows that the number of casualties throughout Laos has declined steadily in the past few years.
Although the graph shows a consistent decline in casualties, there is no empirical evidence to show whether or not these casualties resulted from UXO-related accidents happening in the post-cleared areas or in the pre-cleared locations. However, according to the findings of this study, the number of UXO casualties shown likely came from the areas where the UXO operations have not been carried out.

Another important finding is that, the causes of UXO accidents prior to the operations stemmed from a range of activities performed by all groups of people including children, women, and men. Based on the study conducted by the Mines Advisory Group (2006), Durham and Ali (2008), and Osterlind (2008) identify the causes of UXO related accidents as being spread over a variety of activities performed by people in UXO-contaminated communities ranging from agricultural work, children playing with the items, adults tampering with UXOs, scrap metal collection, and several other activities. The report revealed that children playing with UXO accounted for 25% of the accidents, scrap metal collection 21%, tampering with UXO 20%, and the rests are under activities such as foraging in the forest for food, working in the fields, and building fires (Mines Advisory Group, 2006).

Based on respondents’ comments in the research herein, children directly playing with UXO objects was the main cause of accidents in the area. Children who dug the ground for food, such as crickets and crabs, or earthworms for fishing purposes, often found UXOs and they would try to break the objects apart, resulting in accidents. Another cause of accidents came from the searching for scrap metal, which involved both children and adults. The scrap metal
trade was widely practised in the area as most participants said that they saw other people dealing in this business. The intentional attempt to dismantle the live UXO in order to get valuable parts and explosive contents inside the UXO was also a severe cause of accidents. One respondent said that the explosive content was then used to reassemble as explosive devices for fishing purpose. This finding is in line with the study of Moyes et al. (2002), which found that using explosive items made from ERW for fishing purposes is a common practice in many post-conflict nations and communities, and this became one of the causes of the UXO accidents.

The most interesting finding is that, previously, even though villagers knew their land was UXO contaminated, that had not stopped them from cultivating the land because they had no other choice but to use land to grow rice, vegetables, and to perform other agricultural tasks. The need to feed family members was crucial as doing nothing would make them hungry. This point was raised by Howe and Sims (2011) and Moyes et al. (2002) who maintained that some people ignored the UXO threat and continued to work on the contaminated land as they had no other choice. Wyper (2012) describes the circumstances as ‘enforced risk taking’ because it was highly likely that people would have to live in acute poverty or in some cases suffer from chronic malnutrition unless they risked their lives working on the UXO-contaminated land. Hence, performing agricultural activities became one of the many causes of UXO accidents.

However, on a positive note, none of these activities has led to UXO accidents after the UXO operations in the village this study investigated. Although subsistence agriculture is what the respondents get involved with every day, they no longer encounter the UXO problem.

5.10. Scrap metal trade

The literature indicated that the scrap metal business is largely practised throughout the UXO-contaminated areas in Laos (Durham & Ali, 2008; Mines Advisory Group, 2006; Moyes et al., 2002; Osterlind, 2008; Wells-Dang, 2006). However, the finding of this study shows that the scrap metal trade was not a major issue in the village prior to the UXO operations. Participants said the scrap metal price at the time was low and did not catch their attention. Nevertheless, some participants reported that their children used to deal in such business activity in order to earn some money to buy candies. One participant reported she used to deal in the scrap metal trade because it helped her to earn the cash to buy some food ingredients and candies for her children. In fact, many of the respondents said that they saw
other people dealing in the scrap metal business, and this implies that this activity existed in the area in the past and that some of the respondents may have dealt in the activity but did not say so. In this regard, Moyes et al. (2002) and the Mines Advisory Group (2006) noted that the scrap metal trade was reignited by the impoverishment of the UXO affected communities. In addition, outsiders were to be blamed as the study called A Study of Scrap Metal Collection in Lao PDR conducted by GICHD (2005) found that respondents pointed their fingers at traders from a Lao neighbouring country. They said that scrap metal business was driven by the wandering dealers. According to Moyes et al. (2002), economically marginalised communities often found that collecting scrap metal, including UXO fragments, for selling was one of the few options for them to earn some extra income. As a consequence, a demand for scrap metal could lead poor communities, including their children, to directly come into contact with UXO.

The finding of this study also shows that some people in the village still deal with the scrap metal trade, but they buy and sell only automobile parts. This finding indicates that the UXO operations carried out by commercial companies in the village have played a substantial role in the decline of the scrap metal trade in the village. In fact, the study of GICHD (2005) reported that the decline of the scrap metal trade was because “people see the metal as a finite resource that is being rapidly exploited now but which will become harder and harder to find in future years” (p. 19).

5.11. Unexploded ordnance clearance effectiveness

According to the National Regulatory Authority (2012b), operating UXO-related tasks in accordance with the requirements specified in the National UXO/mine Action Standards (NS) is vital. In this study, the findings reveal that all participants were generally satisfied with the UXO clearance quality even though two of them had found some UXOs on their land. The participant who had found one UXO on his land said that if he had to rate the clearance thoroughness he would say 99% out of 100%, while another who had found two UXOs said he would put the score at about 80-90%. However, UXO operations cannot be solely blamed because there could be a number of reasons remaining behind the scene. The UXOs could have been placed or washed into the area. Another possibility is that Quality Control (QC) may not have detected the object in the land quality check because QC only covered 2% of the cleared land according to NS (National Regulatory Authority, 2012a), or, indeed, this task may not have been undertaken in the area. According to the National Regulatory Authority (2014), its Quality Management Unit (QM) has as its objective to monitor the compliance of
UXO operators with the National Standards. One of the tasks of QM is QC, which aims to inspect the quality of clearance-related activities including checking the post-cleared land so that it can be released for use (National Regulatory Authority, 2012b). However, if QC was at fault, the reason might be as mentioned in the UNDP’s report, which stated that “funding limitations and capacity challenges continue to constrain national abilities to conduct quality control and quality assurance for all operations” (United Nations Development Programme, 2012, p. 10). Based on the UXO Sector Evaluation Study conducted by Griffin et al. (2008), the NS had not yet been approved and the NRA was in the process of hiring a person in charge of the function at the time. As a result, not every piece of land cleared by UXO operators had been checked.

Regarding the clearance coverage, this study’s respondents said that more areas in the village vicinity should be covered as they believed that there could be a lot of UXOs in places next to the cleared land. They also said that clearance should have been undertaken in places such as bamboo forests, and natural fish pond areas where villagers like to go to find food. The findings show that participants were not so satisfied with the clearance coverage. However, blaming the UXO operators for the issue might not be the point because, according to the respondents, only commercial operators had entered the village and they could only perform their tasks in accordance with the contractor—the NTPC. As a result, the places not under NTPC’s responsibility could not be UXO cleared.

One surprising finding is that UXO clearance also brought about some negative consequences for the village. According to the village chief, when seeing the UXO teams using metal detectors, some villagers wanted to do the same thing by bringing in artificial metal detectors. This observation is backed up by Durham and Ali (2008) who said that some villagers, including men, women, and children, tried to surreptitiously watch UXO operation teams using detectors with UXO, and they would use the locally-made artificial detectors to search for metal. This action, on the one hand, could suggest that people had developed a strategy to cope with UXO danger. On the other hand, it might have persuaded people to pay more attention to scrap metal collection, which could lead to a more complicated issue for the effort to reduce the UXO risk. However, in this research area, fortunately, the issue was resolved because the local police officers found out and seized all the artificial detectors and kept them in the store. This suggests that if the villagers had managed to use the fake detectors, they could have been in extreme danger because they would have been digging the ground without specialised skills and that could have caused serious accidents.
5.12. The need for further UXO clearance

The findings indicate that, although satisfied with the clearance thoroughness, most of the respondents still wanted further clearance to take place in the village vicinity. The two interviewees who have found UXOs in their gardens said they wanted UXO operators to re-clear their land if possible, while another participant who had heard the story about a large bomb found in the cleared area said it made him have doubts about the clearance thoroughness.

Despite wanting further clearance, many of the informants reported that there might not be many UXOs left in the village surroundings. One respondent said that he understood UXO organisations would not have enough funds to perform clearance everywhere required by the villagers. According to Mine Action Canada (2009), the NTPC spent over USD16.7 million on the UXO operational tasks in Nakai and other areas affected by the hydropower project. Yet, the respondents still required further UXO operations in the village area where villagers go to find forest products. In this regard, the UXO operators, particularly the humanitarian organisations, mainly focus on agricultural land as the priority in terms of land clearance because attempting to clear everywhere contaminated might be unnecessary, would take an unpredictable amount of time, and would consume a massive amount of funds (United Nations Development Programme, 2012). In addition, it is stated in the national strategic plan called The Safe Path Forward II that one of the three main targets of the UXO impact reduction is to complete clearance of UXO from priority/high value agricultural land (GICHD, 2014; Government of the Lao PDR, 2012; Government of the Lao PDR & The United Nations, 2010). Therefore, further UXO clearance in the village surroundings should not be necessary. However, based on the information reported by the village chief, some villagers had reported to him that they had found UXOs both inside and outside the cleared land, but nothing could be done because there had been no UXO-concerned organisation in the area recently. This clearly shows that villagers still need to be able to access a concerned organisation or some kind of system so that villagers who find UXOs can place reports.

The findings also reveal that most participants suggested UXO operators pay more attention to areas where there are obstacles such as logs, creeks filled with water, and where it could be hard to use UXO detectors. This is because they thought these components might be the issues that undermined the capacity of the operations.
One important finding is that the UXO teams did not respond to the reports of UXO fast enough, which caused anxiety for some adults as they felt worried that their children would see and play with the objects. As a result, some respondents had to move the UXOs somewhere else as they believed doing so would make it both safer for children, and for those cultivating their land. This finding was apparent also in the study of the Mines Advisory Group (2006), which revealed that clearance agencies were unable to respond in a timely manner to the reports of UXO; therefore, people moved any UXOs found out of the farming land as they believed that taking the objects further away would be safer than leaving them where they were. MAG’s study also showed varied responses to UXO found; some took weeks, months or even, years, while in some cases there was no response at all. To address this issue, in the National Strategic Plan for the UXO Sector 2011-2020 called *Safe Path Forward II*, one of the indicators of achieving its objectives is that UXO operators could respond to the reports of UXO within seven days (Government of the Lao PDR, 2012). This means that the responding time to the reports of UXO is being improved.

5.13. **Risk education effectiveness (knowledge about UXO awareness)**

One significant finding is that respondents who took part in the RE activity seemed to be predominantly satisfied with the sessions organised in the village, although two of them said that they had not joined the activity. It was revealed that participants still remembered the UXO awareness messages relatively well. Some said the sessions had included playing games, showing participants pictures of all kinds of UXO, puppet shows, the instruction about the kinds of tools utilised in agricultural practice, and several other activities related to the UXO awareness. It was mentioned in the literature, too, that RE sessions in Laos comprise puppet shows, playing games, drawing pictures, and asking and answering questions relating to the UXO (United Nations Development Programme, 2009). Risk education has played a significant role in the UXO operational tasks and the efforts to tackle the negative effects caused by UXOs throughout Laos (Boddington & Chanthavongsa, 2010; Durham & Ali, 2008; Mines Advisory Group, 2006). In this sense, the fact that respondents maintained good recall of the RE session implies that RE activity was significant in the village. In addition, an essential outcome was that participants had also talked to their children when they returned home from the RE session.

One surprising finding was that, despite UXO awareness-raising, some interviewees failed to follow the instructions given. For instance, two respondents have still touched and moved the UXOs found in their gardens. This action indicates that some respondents are still at risk of
UXO even though RE has already been provided. Moving UXOs can be described as a dilemma because participants said they moved the objects in order to hide them from children. In fact, one of the two participants also showed the researcher a part of the UXO item which he had cut up with a hacksaw, thrown away the part he thought was dangerous, and used another part that he said was safe as a pounding facility. This action can be linked to the GICHD (2005) study which stated that respondents may report that they would not touch UXO when in fact what they really mean is that they would not handle the UXOs that they believe are hazardous. In a similar manner, another informant for this study who had found two bombies and moved them onto the stump had not taken part in the RE sessions, but said it would be safer for him to move the items somewhere.

Another interesting finding is that not everyone who was at risk in the village had joined the RE sessions. This indicates that RE lacked coverage and is aligned with Paterson et al. (2013) who said that the coverage of RE in the UXO/mine affected area was far from universal. The authors further revealed that not all children and women had attended the session as many of them had restricted mobility. In this current research, however, women were more likely to attend the RE sessions than men. These findings suggest that RE information dissemination needs to be improved because two of the participants reported that they did not know if the UXO operators had provided RE in the village and so they have not joined the session.

The inadequacy of the RE message dissemination was also mentioned by the Mines Advisory Group & National Regulatory Authority (2007). Here it was recognised that a short visit of an RE team could not provide long-term support and put the whole RE strategy into practice because most of the UXO high-contaminated areas happened to be in remote areas, making it hard for the RE team to enter on a regular basis. To address this issue, UXO Lao and HI developed a community-based approach by focussing on training local volunteers to carry out the RE messages (Mines Advisory Group & National Regulatory Authority, 2007). This same approach, if provided in the research location, might be a useful option. An alternative could be that RE activity takes place in the non-farming season. This way, more villagers could stay at home and have time to take part in the activity.

5.14. **Necessity for further risk education**

Although RE activity has a positive reputation in the village, the findings show that 10 out of the 11 participants wanted RE to take place in the village again. They said that the activity should be organised continuously due to the fact that new generations need to gain UXO
awareness. The respondent who said he had taken part in the RE sessions still appeared to be moving the UXO because he wanted to get it out of the way of children. This finding matches the result of the study carried out by Durham and Ali (2008) as it revealed that, despite acknowledging UXO risks, 74% of its adult respondents still moved UXO founds on their farm land. This indicates that, in theory, all the respondents who had joined the RE activity understood relatively well about the UXO awareness; however, in practice, some respondents failed to follow the instructions. The findings suggest two factors:

(1) Information regarding RE activity was insufficiently disseminated and so had not reached all villagers at risk. (RE lacked coverage)

(2) Villagers knew about it, but did not want to join or they were busy with other tasks;

The first factor can be linked to the report from some respondents saying that only one UXO operating company provided RE activity in the village. This is backed up by the report from the NRA which showed that only one company was contracted to perform the task in this research area plus other 16 villages in Nakai (National Regulatory Authority, 2008). The findings suggest that the RE unit needs to coordinate all relevant stakeholders in the designated location so that the RE information can be better disseminated and reach all people at risk. Further, according to the latest report from the National Regulatory Authority (2014), through its TWG in cooperation with the Ministry of Information and Culture (MIC), the UXO awareness messages have been recently broadcast via radio to many UXO-vulnerable communities. In the research location, however, the radio broadcast is not available. In fact, whether or not further RE is necessary in this same area seems to be controversial because no literature has mentioned that RE has been organised in one place more than once.

5.15. Concerns over the future of the village agriculture

One interesting finding is that the NTPC’s agricultural projects have substantially facilitated villagers’ subsistence farming activities. As a consequence, most of them had started to worry when they realised that the NTPC agricultural projects were coming to an end. According to the NTPC, the agricultural centre located in one of the resettled villages was handed over to the district authority to take charge in 2013 prior to its departure (Nam Theun 2 Power Company, 2013a). This means that villagers in the area will continue to get support in terms of agricultural lessons including techniques and demonstration.
Some respondents said that without UXO operations, the NTPC would not be able to enter the area. This notion is highlighted in the literature that explained how UXO clearance served as a prerequisite multiplier to the development in the UXO-contaminated area throughout Laos (United Nations Development Programme, 2012). In this sense, the findings show that several basic developmental structures were allocated to the village after the completion of the UXO operations.

Another interesting finding is that some participants argued that intervention by other agriculture developmental organisations may not be a solution because they said the NTPC has provided support in several ways; yet, some people tended to focus on activities other than agriculture, such as fishing and the illegal logging business. In fact, the illegal logging activity was also addressed in the Nam Theun 2 Board Update and the Case Study of GIZ, which stated that the Village Forestry Association (VFA) is encountering the threat to its resources due to the illegal logging business in its land area (Sacklokham et al., 2014; The World Bank & Asian Development Bank, 2011). The report also revealed that the VFA is endeavouring to solve the issue by eliminating the non-VFA sawmills, but it said this cannot be accomplished in a short period of time. Hence, it can be said that the intervention of other developmental organisations may not be a complete solution to the agricultural sector unless the problem of illegal conduct has been solved.

5.16. Summary of the key findings

The study has shown that the UXO operations carried out by the commercial operators have significantly contributed to the livelihood, safety, and the developmental status of the village. The following are the key findings of this study.

- According to the participants, the village has had a great safety record because there have not been any UXO-related accidents since the commencement of the UXO operations.

- Agricultural land can be accessed without fear of UXOs, although some UXOs have still been found in the post-cleared areas. As a result, respondents are able to grow more rice and crops for eating and some villagers grow enough to sell.

- Participants have more confidence and are not scared to work on the ground. When they have confidence, it is easier for them to perform tasks and they can also work faster.
• Parents are no longer worried about their children’s safety. Children can play around without hitting UXOs. As a result, villagers are both physically better off and psychologically happier. Although many people think there could be more UXOs around the village vicinity, most villagers have become well aware of the dangers posed by UXO thanks to the risk education team.

• UXO operations genuinely serve as a prerequisite for multiple developmental purposes. In this sense, the operations have paved the way for a number of basic developmental projects to take place in the village. These include the construction of public infrastructure - such as roads, schools, a healthcare centre, the water supply and household infrastructure - such as houses.

• Despite not being 100% satisfied with the clearance coverage, participants are generally happy with the overall operations carried out by commercial companies.

• UXO operations have assisted villagers to have better relationships within the family, with neighbours, and with residents from neighbouring villages. This can be gathered from the comments made by some respondents who said that instead of talking about UXO problems, parents talked to their children about their school studies. They said they socialise more, which in turn has strengthened their relationships. More importantly, villagers do not have to mistakenly invade land belonging to other villages as they have their own land and it is free from UXO.

• UXO clearance together with the developmental organisation— the NTPC—have helped villagers to cease the shifting slash-and-burn agricultural practice.

• Some families are found to have turned the UXO cleared land into businesses while others have left the land uncultivated due to a number of reasons. Some said the land quality faded after a few years of use, while others said they lacked implemental facilities such as money to pay for a bulldozer to level the land. Some said they lacked labour and so could not put up fences to keep cattle away, while others said they lacked proper agricultural knowledge and skills. In contrast, according to some respondents, the NTPC has provided a great deal of support in terms of agriculture, including the provision of seedlings, fertilizers, and knowledge and techniques. Yet, some people still focus on other businesses including illegal logging activity.
• Reports of UXOs found after the clearance were not responded to quickly enough. As a result, parents were worried that their children would find and play with the objects. Hence, some people moved the UXOs found in order to hide them from children.

• Despite the RE having a good reputation in the village, the act of touching and moving UXOs is still occurring. One respondent who said he had joined the RE session explained that he had dealt with UXOs by moving them and cutting off UXO parts for household use because he wanted to get them away from children’s sight.

• Injuries caused by UXO accidents in the past had not been responded to in a timely manner due to the lack of medical facilities in the local health centre. The injured victims were therefore transported to hospitals in cities far away. As a consequence, some injured victims had died. The inadequate state of medical facilities was also reported by Wyper (2012) who said that UXO incidents normally occurred in the remote areas where UXO contamination is high and the victims had limited access to medical facilities.

5.17. Recommendations for the improvement of UXO operations

Based on the respondents’ perspectives and the findings of this study, UXO operations carried out by commercial companies in the research area have had a significant impact on the well-being and safety of the villagers. UXO clearance has provided safe access to agricultural land and paved ways for developmental organisations to intervene. As a result, basic infrastructure systems, including roads, healthcare, a school, and water supply needed to support the livelihood of UXO-affected communities, were able to be established. In addition, UXO risk education has assisted the participants to become aware of the UXO danger and hence accidents could be avoided. However, there appears to be a few key issues that need to be further addressed and improved.

1. UXO operations conducted by commercial operators should be properly assessed by the concerned party such as the NRA in order to ensure that the NS is rigorously followed and the cleared land is 100% free of UXO. This will result in land users securing maximum safety when performing agricultural tasks.

2. UXO clearance should be undertaken based on seasons that will not affect the capacity of the operations. This means that the tasks should not be performed in the rainy season if the area to be cleared has water that may affect the capacity of the
UXO detectors. Alternatively, UXO operators may use equipment that can be utilised in the rain or under water so that it will not affect the work flow.

3. UXO operators, particularly the commercial companies or the contractors, should pay more attention to vegetation clearance prior to the commencement of the UXO clearance. To achieve this, a commercial operator or a contractor could pay villagers in the area to clear vegetation, and if the place is properly cleaned, meaning without vegetation or objects that may affect the capacity of the detectors, UXO clearance tasks can be done to the maximum standards. If the area is not properly cleaned, it is unlikely that the place will be properly cleared and UXOs could be left behind.

4. Risk education activity should be provided as an on-going activity in places where UXO contamination is high. The activity should occur from time to time because new generations need to receive UXO awareness training. In addition, the RE team should work in the village outside of the farming season when villagers may not be so busy and thus have a better chance of being able to take part in the RE activity.

5. Reports of UXOs should be responded to more urgently so that those who find UXOs do not have to be worried about the safety of their children. In addition, the UXO operator and the local authority should come up with a strategy so that when the team leaves the area, villagers who find UXOs know who to report to.

6. Health facilities should be improved so that victims of UXO-related accidents can be dealt with in situ. This way, injured victims could be treated in a timely manner and may avoid disability or death.

7. If possible, the commercial operators in collaboration with contractors should provide other tasks related to UXO issues. Besides solely land clearance, RE activity and victim assistance should also be considered by the commercial operators. The contractors that pay the commercial companies may not be able to allocate funds for other tasks, but this issue should be taken into consideration when UXO operations take place in heavily contaminated areas.

8. Based on feedback from the respondents, UXO clearance has provided safety, but may not have had a significant impact on agriculture unless agricultural development projects had intervened. Hence, UXO operators and developmental organisations should closely cooperate in order to maximise benefits for the UXO-affected communities.
5.18. Research limitations

- Based on the participants’ comments, only commercial UXO operators contracted with Nam Theun 2 Power Company (NTPC) had worked in the location. This means that this particular study is based on the area where UXO operations were carried out by the commercial operators. Hence, the study results might be different from that of studies conducted in the areas where operations were carried out by the humanitarian operators.

- It is hard to identify how much the UXO operations conducted by the commercial companies have impacted the well-being or the living conditions of people in the research area because the NTPC’s resettlement projects have played a big role in the developmental aspect of the village. However, without UXO operations, none of the developmental projects could have happened.

- The research study could not accurately involve participants as mentioned in the research proposal due to several reasons. For instance, villagers were rarely at home during the day time while the researcher was in the location because they were away carrying out their daily duties, such as looking for food and performing subsistence farming. In addition, young people have left home and moved to cities to pursue their dreams for education and employment. As a result, this study could not recruit enough young participants as was originally planned.

5.19. Considerations for further research

Based on the limitations of this research, further research should be conducted around these issues in order to clarify the impact of the UXO operations on the living conditions of the UXO-affected community.

Further research should utilise multiple data collection methods by employing participants who are not solely from the UXO-affected community, but from commercial UXO operators, humanitarian organisations, and from the UXO/mine sector such as the NRA. This way, the new research could entail different perspectives and the data could be better triangulated.

In addition, the new research should be carried out in the area where UXO operations have been undertaken, but no developmental organisation has intervened. By doing so, the genuine impact of the UXO operations on the well-being and safety of the affected community could be substantially revealed.
Researchers should not start the field work for the data collection in the farming season because potential participants are fully engaged with their farming activities. Rain is also an issue in Lao rural areas in the farming season. Therefore, researchers should seek to avoid these problems by going to the field in the dry season if possible.

5.20. Conclusion

The UXO operators - humanitarian or commercial -have had a substantial impact on the general well-being and the safety of the UXO contaminated community in Laos. In the research area, although UXO operations only finished about five years ago, changes regarding living conditions, safety, and socio-economic and developmental status can be clearly seen. These changes might not have happened without the intervention of the developmental organisations.

The study has also revealed other changes resulted from the UXO operations; these reflect the well-being of the research respondents, as well as other villagers. Increased happiness could also be identified among the participants based on their perceptions. They all said that they were happy and had no more worries about the UXO issues. They have had no more concerns about the safety of their children and the people they know. One of the striking revelations is that respondents said they had more opportunities to socialise as a consequence of the risk education activity. As a result, respondents have stronger relationships with their family members and neighbours. Another significant point is that there have not been further arguments over land ownership between villages as the majority of the villagers have had their own UXO-free land for their subsistence farming activities. This means that the villagers and their neighbours also have amicable relationships. Last but not least, there have not been any UXO-related accidents since the introduction of the UXO operations and this suggests that respondents, as well as other villagers, have had greater safety. Although some UXOs have still been found and some other UXO-related issues have still arisen, the UXO awareness villagers have received should be able to help them live in a much safer environment. Most importantly, the main conclusion that can be drawn is that all the major findings stated above have contributed to the well-being of individuals as well as the community. Several prominent authors, including Steuer and Marks (2008) and Vermon (2010), have explained how good living conditions, physical and mental happiness, good relationships with other people, and other collective goods are all parts of well-being. Likewise, Gough and McGregor (2007) propose that good socio-economic status and social security are some of the components of the well-being. The well-being of the people of Nakai
in Khammouane province are now safer and happier as a result of the UXO clearance and therefore better placed to contribute to the socio-economic development of their families and the country as a whole.
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APPENDIX 1: INTERVIEW QUESTIONS (INTERVIEW GUIDE)

1. What concerns you most about UXO?
2. What major differences in your living conditions and safety issues can you identify since the intervention of UXO operations?
3. What is life like now in relation to the following issues?
   • How has UXO clearance affected your farming and gardening conditions?
   • How has UXO clearance affected your family’s economy?
   • How has UXO clearance contributed to the improvement of your food resources?
   • How have UXO clearance and RE improved your relationships with partners, children, relatives, and other villagers?
   • How have UXO clearance and RE affected your transport circumstances?
   • What are the state of accidents, deaths, and injuries like in the present day after the UXO operation intervention?
   • What is the state of the scrap metal trade like right now?
   • Do you think villagers need further RE and clearance? Why?
4. How much have UXO clearance and risk education changed your way of life?
   • How good was the clearance process—coverage and thoroughness; and RE process? If not good, how could they be improved in your view?
   • In what other ways have UXO clearance and RE made your life better? Worse?
5. What can be done to improve UXO clearance and risk education by a commercial company in your view? (in Nakai—if there are still issues there—, in other villages)
6. What factors could be implemented and integrated so that the land cleared is more productive and risk education sessions have more impact on people’s behaviours towards UXOs?
7. Demographic questions: age group of the participant, gender, occupation, family size and structure, role within the village, etc.
APPENDIX 2: INFORMATION FOR PARTICIPANTS

INFORMATION FOR PARTICIPANTS

‘Assessing perceived well-being and safety of the Lao rural community in Nakai, Khammouane province as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities’

My name is THONGKHAM CHANTHAVONG. I am a Postgraduate student studying in a master degree in Social Practice at Unitec Institute of Technology, New Zealand. To complete my thesis in a master qualification, I need to undertake a research study on the assessment of well-being and safety issues of villagers in Nakai as a consequence of unexploded ordnance (UXO) clearance and risk education in order to investigate whether UXO operating intervention has made significant change to residents’ living conditions. Nakai was heavily contaminated with UXOs during the war and UXO operations just took place about five years ago in the location. However, UXO related incidents still occurred. This study may be able to uncover the reasons behind the incidents, and thus, could help improve UXO operations to be more effective in the future.

What am I doing?

As part of my Masters qualification, I am conducting a research study. The aims are to assess the perceived association between UXO presence/absence and social, economic, and environmental status of Nakai villagers; and to explore living condition and safety issue as a consequence of the completion of UXO clearance and risk education in this area.

By attending this project, you will be asked to provide me information relating to UXO issues, UXO operational intervention, and their association to your living conditions. The session will take about 45-60 minutes, and the interview will take place in your village at the convenient atmosphere. Your comments and suggestion will not be identified as coming from you and there will not be any negative consequence as a result of your words. All information
I get from you will be treated confidentially. Your name and all identifying features will not appear in this study.

I would like to get permission from you that the interview will be audio recorded and it will then be transcribed. The transcripts will be given to you later on to check for accuracy. If any information on the transcripts needs changing, it is your right to take out or add in until you are satisfied. If you wish, you can also access the final copy of this study.

Once you agree to take part in this study, I will confirm your eligibility and you will be required to sign a consent form. However, although you are already selected, you still have the right to withdraw from this study if you are not happy. But please be aware that this must happen within two weeks of reviewing transcripts so that the schedule set will not be seriously affected.

All information that you provide will be treated confidentially. It will be kept in a safe place with password locked. Only you, my supervisors, and me as a researcher can access this information. Your village’s name will be appeared in the report, but that will not link to your personal identity. The information you provide may be identified by other villagers who take part in this study through your viewpoints or professional in the village, but sensitive points will be avoided in the interview. If you are concerned about this issue, you have any right to fix the transcript.

If you agree with the terms and conditions, please sign the consent form and provide your contact details as indicated, and return it to the sealed box in the village office, then the researcher will collect the box once all consent forms are inserted in it.

If you have any queries about this research study, please do not feel hesitate to contact my Principal Supervisor Gavin Rennie at Unitec, New Zealand, telephone: +6498152981, email: grennie@unitec.ac.nz; or Sue Elliott, telephone: +6498154321 ext 5151, email: selliott2@unitec.ac.nz

**UREC REGISTRATION NUMBER: 2014-1040**

This study has been approved by the UNITEC Research Ethics Committee from 26 May 2014 – 26 May 2015. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC secretary (ph: 09 815-4321 ext 6162). Any issues you raise will be treated in confidence and fully investigated, and you will be informed of the outcome.
APPENDIX 3: PARTICIPANT CONSENT FORM

PARTICIPANT CONSENT FORM

‘Assessing perceived well-being and safety of the Lao rural community in Nakai, Khammouane province as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities’

I have had the project explained to me and I have read and understood the information sheet given to me.

I understand that if the number of potential participant exceeds the places available, I may not be chosen to take part in this study. I also understand that if I do not want, I do not have to be part of this research project.

If I am chosen to be part of this project:

I understand that I have the right to withdraw from the study within two weeks after receiving the transcript. I am aware that all the information I provide will be treated confidentially. I also understand that all the information I give will be securely stored with only authorised persons as mentioned above, and that Unitec will keep it safely for the period of five years.

I understand that the interview and discussion between the researcher and I will be audio recorded. The information will then be transcribed and the transcript will be sent to me for correction and accuracy. And I also understand that I can access the final research document.

I have considered and agreed with all the process, and I am willing to give my consent to be part of this research project.

Participant’s name: ........................................................................................................................................

Participant’s signature: ................................................................. Date: .................................

Participant’s contact details: ........................................................................................................................................
Researcher’s name: **Thongkham Chanthavong**

Researcher’s signature ........................................ Date: ........................

Please return the signed consent form to the sealed box in the village office as it will be collected by the researcher afterward.

**UREC REGISTRATION NUMBER: 2014-1040**

This study has been approved by the UNITEC Research Ethics Committee from 26 May 2014 – 26 May 2015. If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC secretary (ph: 09 815-4321 ext 6162). Any issues you raise will be treated in confidence and fully investigated, and you will be informed of the outcome.
APPENDIX 4: APPROVAL LETTER TO CONDUCT RESEARCH FROM UNITEC

Thongkham Chanthavong
Apt 13, Room 13E
1510 Great North Road
Auckland 1026

26.6.14

Dear Thongkham,

Your file number for this application: 2014-1040
Title: Assessing perceived well-being and safety of the Lao rural community—Nakoi, Khammouan province—as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities.

Your application for ethics approval has been reviewed by the Unitec Research Ethics Committee (UREC) and has been approved for the following period:
Start date: 25.5.14
Finish date: 25.5.15

Please note that:

1. The above dates must be referred to on the information AND consent forms given to all participants.
2. You must inform UREC, in advance, of any ethically-relevant deviation in the project. This may require additional approval.
3. Organisational consent/s must be cited and approved by your primary reader prior to any organisations or corporations participating in your research. You may only conduct research with organisations for which you have consent.

You may now commence your research according to the protocols approved by UREC.

We wish you every success with your project.

Yours sincerely,

Gillian Wholley
Deputy Chair, UREC

cc: Gavin Rennie
Cynthia Almeida
APPENDIX 5: APPROVAL LETTER FROM NAKAI DISTRICT AUTHORITY (LAO)
APPENDIX 6: APPROVAL LETTER FROM NRA

Laos People’s Democratic Republic
Peace Independence Democracy Unity and Prosperity

Government’s Office
National Regulatory Authority
for UXO/Mine Action Sector in Lao PDR

No 307/NRA
Vientiane Capital: 27 May 2014

To: Unitec Institute of Technology

Subject: Approving the Master student to take trip to Naichai village, Khammouane Province to collect data on the impact of UXO for his thesis.

- According to the proposal letter of the student for collecting the data on the impact of UXO for his thesis.

The National Regulatory Authority for Mine Action/UXO Sector (NRA) has agreed to consider the proposal letter of Mr. Thongkham CHANTHAVONG, Master student, writing the Master’s thesis at the Unitec Institute of Technology, New Zealand, to allow him to take the data at Naichai village, Khammouane Province for collecting the data on the impact of UXO for his thesis. After consideration, the NRA has agreed to allow him to collect the data with local people and UXO operators in Khammouane Province.

Yours sincerely,

Phouchchieo CHANTHASOMBOUN
Director General

Stungvone village, Saysetha District, Vientiane Capital. P.O Box 7261 Tel: (856-21) 262266 Fax: (856-21) 262395 www.nra.gov.la
APPENDIX 7: APPROVAL LETTER FROM NRA (LAO)
Full name of author: Thongkham Chanthavong

ORCID number (Optional): ..........................................................

Full title of thesis/dissertation/research project ("the work"): 

"Assessing perceived well-being and safety of Lao rural community in Nakai, Khammouane province as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities"

Practice Pathway: Social Practice

Degree: Master of Social Practice

Year of presentation: 2013-2015

Principal Supervisor: Gavin Rennie

Associate Supervisor: Susan Elliot

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AND

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Signature of author: 
Date: 28/9/2018
Declaration

Name of candidate: Thongkham Chanthavong

This Thesis/Dissertation/Research Project entitled: “Assessing perceived well-being and safety of Lao rural community in Nakai, Khammouane province as a result of completed Unexploded Ordnance (UXO) clearance and risk education activities” is submitted in partial fulfillment for the requirements for the Unitec degree of Mater of Social Practice

Principal Supervisor: Gavin Rennie
Associate Supervisor/s: Susan Elliot

CANDIDATE’S DECLARATION

I confirm that:

- This Thesis/Dissertation/Research Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

Research Ethics Committee Approval Number: 2014-1040

Candidate Signature: [Signature] Date: 28 September 2018
Student number: 1415062