



A STUDY ON THE LINK BETWEEN DEMINING ACTIVITIES AND IMPROVED FOOD AND NUTRITION SECURITY

Anlong Veng District, Oddar Meanchey Province

Prepared for

**WELTHUNGERHILFE, THE HALO TRUST, IRISH AID
& KHMER BUDDHIST ASSOCIATION**

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ABBREVIATIONS AND ACRONYMS

CEDAC	Centre d'Etude et de Développement Agricole Cambodgien/Cambodian Center for Study and Development in Agriculture
CMAC	Cambodian Mine Action Centre
ERW	Explosive Remnants of War
FGD	Focus Group Discussion
FNS	Food and Nutrition Security
KBA	Khmer Buddhist Association
LICADHO	Cambodian League for the Promotion and Defense of Human Rights
MLMUPC	Ministry of Land Management, Urban Planning and Construction
MRE	Mine Risk Education
NGO	Non-Government Organizations
NTFP	Non-Timber Forest Products
RBA	Rights-Based Approach
SCW	Save Cambodia's Wildlife
UXO	Unexploded Ordnance
WASH	Water, Sanitation and Hygiene
WHH	Welthungerhilfe

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EXECUTIVE SUMMARY

The study aims to identify the impacts and provide evidence of the linkages between landmine clearance and improved food and nutrition security (FNS) classified by the four dimensions: availability, accessibility, utilization, and stability, by identifying factors and circumstances that enable the linkages. The findings and conclusion are summarized as below.

The HALO Trust significantly contributed to improving livelihoods, food availability, access, utilization and stability. The landmines cleared, and land released allowed for agricultural production expansion as well as safer access to roads, public spaces, and common properties. These results significantly contributed to making food more available and accessible to many farmers in the four target villages (Tumnop, Tuol Krous, Tuek Chop and Trapeang Tav in Anglong Veng district, Oddar Meanchey province) through expanding agricultural land and production as well as better income. Safer access to infrastructures such as roads, community spaces, public ponds and wells greatly contributed to improvements in clean water, sanitation and hygiene for the rural households. Additional income from greater and safer opportunities in collecting bamboos, mushrooms, firewood, as well as on-farm and off-farm employments enabled farmers to better manage their livelihoods as they are able to use the income to address the emergency issues such as disasters and illnesses, season food shortage, and improve food consumption and dietary habits among their families.

Technical trainings on agriculture production delivered by the Khmer Buddhist Association (KBA) made the cleared land even more productive. The practices and application of agriculture technical skills such as crops selection, proper farm management, better use of seeds, fertilizers, pesticides, and drip irrigation provided by KBA helped farmers to productively utilize the land released by the HALO Trust. Supporting different groups including those for farming, marketing, and saving groups helped households facilitate and market their products. Saving groups helped farmers access to loans for investments in agriculture production and household expenditures. The health and nutrition-related trainings by KBA helped raise awareness among farmers about the importance of nutrition related issues and significantly contributed to sounder decisions on household cooking practices and nutriment.

Combined Efforts of HALO Trust and KBA produced stronger impacts. The mine clearance activities of HALO Trust and KBA complemented each other thereby producing greater results in terms of the livelihoods, and food and nutrition for rural households. Demining activities and the land released by HALO Trust expanded agricultural production areas leading to more food and income for farmers. This suggests that HALO Trust contributed to improve food availability, accessibility and income for the rural households as well as a strong basis for food sustainability. Combined with the technical trainings provided by KBA, the agriculture work became more productive, creating strong conditions for food and income generation thus encouraging farmers to continue their activities. In addition, KBA's training on health and nutrition enhanced the understanding of rural households on these issues and encouraged them to make a better use of their food and to positively modify their dietary habits.

The interests of the rural people in the village and commune development planning process are getting stronger. Needs and priorities in terms of local development should ideally be driven by the village and commune council members with the active participation of the community members and villagers. The

study revealed that public participation had not improved much following the initiatives from HALO Trust and KBA due to lack of trust and limited interaction between the local communities and responsible authorities. However, in many instances after demining activities were performed, where more lands released for farmers and public lands are given to communities for public use, safer road access to markets and neighbors, the level of interest of villagers and desire to have their needs fulfilled became stronger suggesting an enhanced awareness of people's rights and the importance of improved social services. People interviewed expressed their interest and willingness to use the village and commune planning process as a platform to voice their needs and concerns for village and community developments.

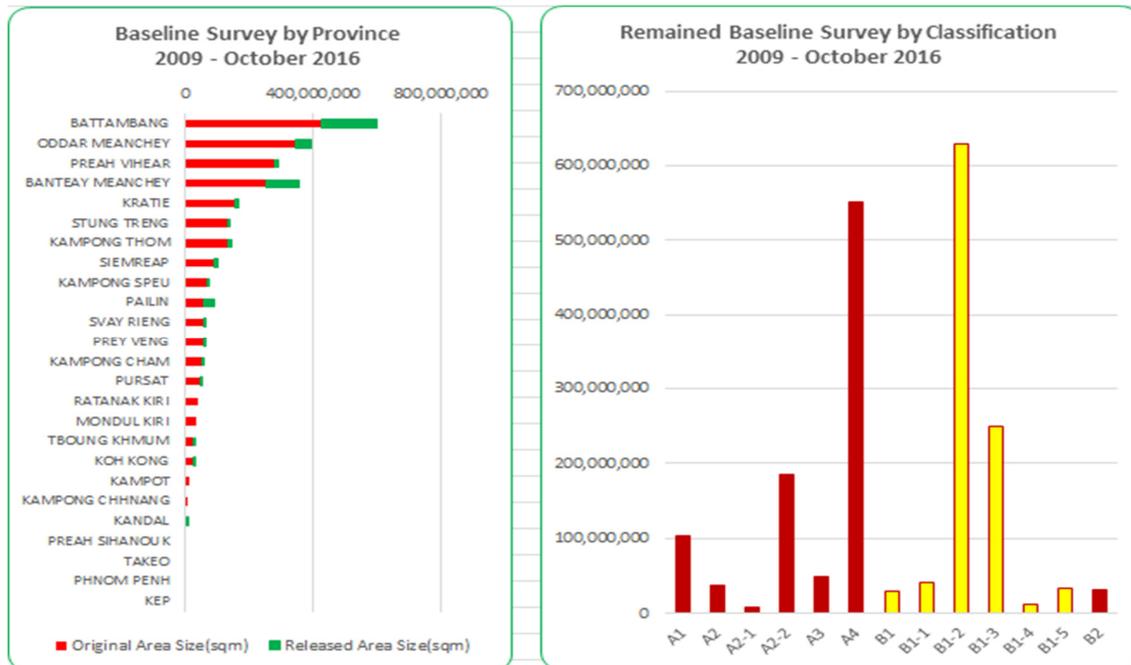
1. INTRODUCTION

1.1 Historical Background and Mine Problem in Cambodia

Cambodia's landmine problem is the result of consequences of international, regional and national conflicts that affected the country from 1960 to 1998. The scale of contamination of landmines and Explosive Remnants of War (ERW) are extensive and complex. The National Landmine Survey completed in 2002 indicated that there were 4,544 sq. km. of land with landmine contamination, unexploded ordnances (UXO), and cluster munitions. The north-western region bordering Thailand is heavily affected. Despite significant progress, landmines and ERW remain a challenge for the lives and livelihoods of people living in and around the affected areas.

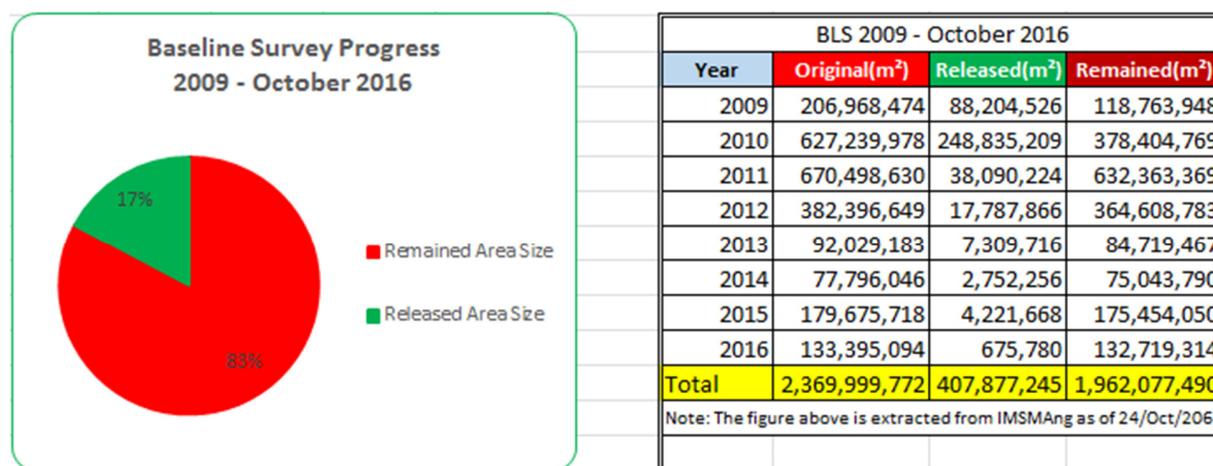
While significant progress has been made, substantially more work needs to be conducted. The Cambodian Mine Action Authority (CMAA) estimates that just over half of the known mine threats across the country have been cleared, and it was noted that significant work still needs to be done. The Oddar Meanchey province is located in northwest Cambodia, and was one of the last strongholds of the Khmer Rouge. Along with other ERW there remains a significant threat to residents, and in particular farmers in Oddar Meanchey and other border provinces. In Anlong Veng, it was estimated that 3,200 ha of land still needs be cleared, with 1,179 ha already cleared. National mine accident statistics show that there have been over 64,000 casualties across Cambodia since reporting began in 1979 and approximately a third being deaths. In 2015, 9% of the casualties were recorded in Oddar Meanchey with 23% occurring in neighboring provinces (WHH/HT/KBA, ToR 2016). According to Figure 1 below, Oddar Meanchey is the second most mine-affected area after Battambang, and much more landmine clearance remain to be done. As indicated in Figure 2, 83% of the total landmine-affected land area nationwide which is around 2 million m2 remain to be cleared and released.

Figure 1: Baseline Survey of Original and Released Land Areas by Province



Source: Cambodian Mine Action and Victim Assistance Authority

Figure 2: Baseline Survey - Released Area and Remained Mine Effected Areas



Source: Cambodian Mine Action and Victim Assistance Authority.

Around 80 percent of people living in rural areas of Cambodia depend on agriculture for their livelihoods and malnutrition remains widespread. The existence and severe impact of landmines, cluster munitions and other items of UXO pose many challenges for rural people notably safety risks which prevent them from accessing common resources and limit their productive use of agricultural land, and restrict the ability of local government to invest in key infrastructures, especially those in north-western Cambodia where most heavily landmines and unexploded ordinance effected areas.

1.2 Understanding the Terms of Reference

The study was undertaken for: (a) reflecting and consolidating evidence-based coherence and linkages between demining and food/nutrition security activities; and (b) strengthening the strategic framework of both Welthungerhilfe and the HALO Trust.

The study seeks to understand the correlation between demining and post-demining interventions, leading to intended outcomes such as improved food/nutrition, income, health, security, and land/natural resources access. The focal households are landless, poor and otherwise vulnerable groups in the district. Key points undertaken include:

- ✓ Reviewing the livelihood status before and after demining activities (by HALO) and livelihood project interventions conducted by WHH and KBA;
- ✓ Analyzing ownership aspects within the framework to improve on-farm and off-farm livelihood strategies and local diet in demined areas;
- ✓ Analyzing current and future traditional land use planning and modern land management mechanisms to improve community access to land consumption for agricultural purposes. Also investigating other underlying livelihood improvement factors and their economic impact as well as people's power in influencing the district-level development process;
- ✓ Consolidating current data provided by WHH and the HALO Trust from ongoing project data collection;
- ✓ Completing additional independent fieldwork with beneficiary households to complement currently available data;

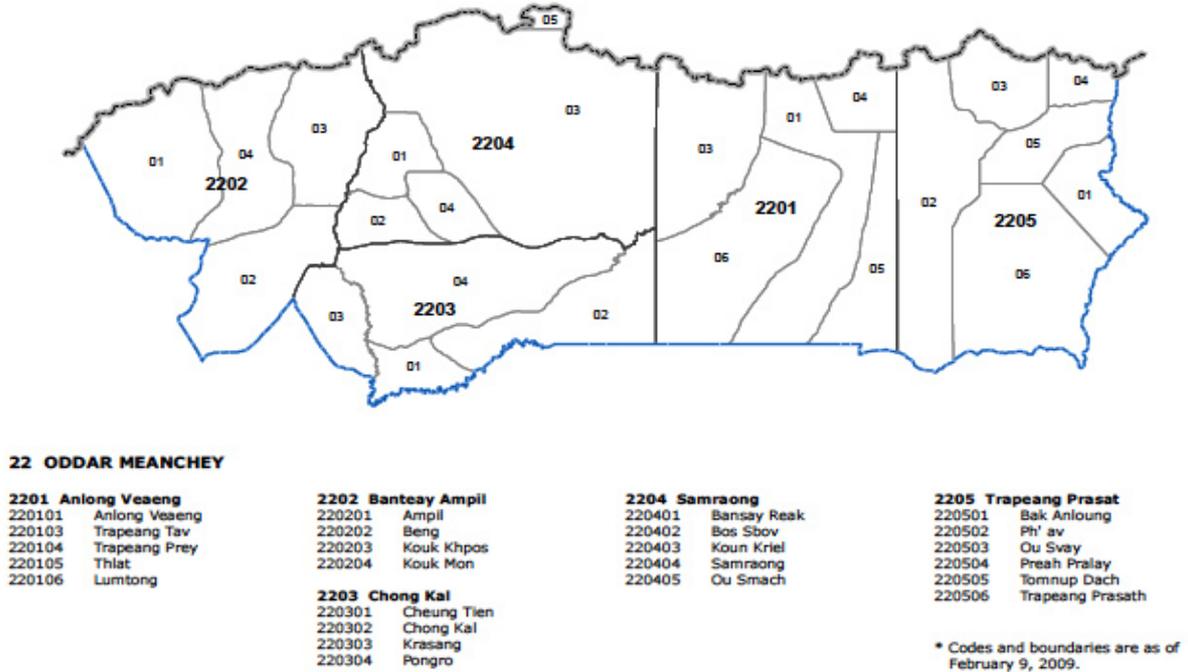
- ✓ Recommendations for strengthened future demining and sustainable food and nutrition interventions.

1.3 Study Strategies and Approaches

The study identifies and provides evidence of linkages between landmine clearance and improved FNS in terms of four dimensions: availability, accessibility, utilization, and stability by identifying factors and circumstances that enabled the linkages. The study used a two-level impact approach to identify the linkages: at the first level the impact of landmine clearance and development activities on livelihoods (food availability and accessibility) were examined; at a second level, the impact on food and nutrition security (food utilization and stability) were examined. The assessment of first-level impact is defined by the increase in agricultural production, household income, improved housing and other assets, increased land ownership and value, improved public safety, increased access to infrastructure (i.e. roads, wells, schools, hospitals, etc.). Assessments of second-level impact focused on access to agricultural land and common property resources, improved physical access and financial access to health care services, clean drinking water, and sanitation through a combined effort of landmine clearance and complementary interventions by the Khmer Buddhist Association (KBA).

- a) The Desk Review** was carried to ensure better understanding of the theoretical foundations of ERW and demining operations, as well changes and impact of demining operations and development interventions. The review focused not only on key documents related to the projects of WHH, HALO Trust, and KBA (i.e. project documents, reports, other secondary data), but also the literature and related reports, lessons learned, and best practices of landmine clearance and development interventions. The results of the desk review was used in designing the field work questionnaires, focus group discussions (FGDs) guides, and observation checklists which were used as tools in getting additional evidence to validate and complement the secondary data. After the desk review, the EVALUATS team, in consultation with WHH, HALO Trust, and KBA, developed a more specific sampling methodology for identifying communities and households where household and key informant interviews (KIs) had been conducted.
- b) The Sampling Strategy.** Different approaches were used for the selection of samples among the household interviews, FGDs, and KIs in the four selected villages. To capture and compare the extent to which the impacts of HALO Trust on the livelihoods and food and nutrition security with and without the development services provided by the KBA, samples for household interviews and the FGDs representing both cases were randomly selected from the list of beneficiaries provided by HALO Trust and KBA. Accessibility, availability, poverty status (ID poor), and gender were also considered when it came to the actual implementation of the field work. Four village chiefs and two commune chiefs from the selected villages and communes were invited for the KIs to obtain an overall view of the impacts of the initiatives both at the household and community levels.

Figure. 3: Administrative Map of Anlong Veng District, Oddar Meanchey Province



c) **The Actual Field Work** in the communities was undertaken to collect information, perceptions, and observations regarding the dynamics of the linkages between landmine clearance, as well as the development interventions/services by WHH/KBA and improved food and nutrition security. Household and key informant interviews, and focus group discussions were conducted with 29 household interviews, 7 KIs and 4 FGDs across the four villages, and the details are in Table 1 below. The field work was structured as described below:

- ✓ **Household Interviews** (semi-structured) were conducted with both beneficiary and non-beneficiary households to capture factors and circumstances that impact livelihoods, food and nutrition security, and other factors in four out of the 11 target villages in Oddar Meanchey. Three villages including Tumnop, Tuol Krous, and Tuek Chop where HALO Trust and KBA collaborated were used as the treatment groups, while only Trapeang Tav village (with the sole support from HALO Trust) was used as control group. Of the 29 interviews, only 6 households were in the control group. The use of treatment and control groups in selecting samples for household interviews is for the purpose of conducting comparative analysis in order to determine the impact between landmine clearance with and without development intervention. Of particular interest were those households that did and did not receive training in nutrition and hygiene/sanitation, as well as training about agricultural production in order to gain better understanding of the complementary synergies across activities. The samples of beneficiary households were drawn from ID Poor 1 and 2 households and non-ID Poor vulnerable households (e.g., female headed households, disabled, and households with members that migrated to other provinces or countries).
- ✓ **Focus Group Discussions (FGDs)** were conducted in each of the four selected villages to capture experiences, perceptions, lessons learned, and success/failure stories of household beneficiaries. Other topics discussed in each of the FGDs include the general situation of the households in terms of their livelihood before and after landmine clearance, food and nutrition

security situation, participation in mine risk education programs, and land use planning and commune development planning processes at the village level. On average, the number of participants in each FGD is composed of at least 10 household representatives, except the one in Trapeang Tav where only six households participated.

- ✓ **Key Informant (KI) interviews** were conducted in four villages and three communes. Four village chiefs of Tumnop, Trapeang Tav, Tuol Krous, and Tuek Chop were interviewed to provide better perspectives on how HALO Trust conducted demining activities in their respective villages, and the impacts of KBA activities in the communities. In addition, two commune chiefs and one commune council member of Trapeang Tav, Thlat, and Trapeang Prei were interviewed to obtain a deeper understanding on the commune and village situation before and after demining operation of HALO Trust and the corresponding impact on community livelihood, food and nutrition security. The consultation also focused on understanding the initiatives and interventions of the government and other players.

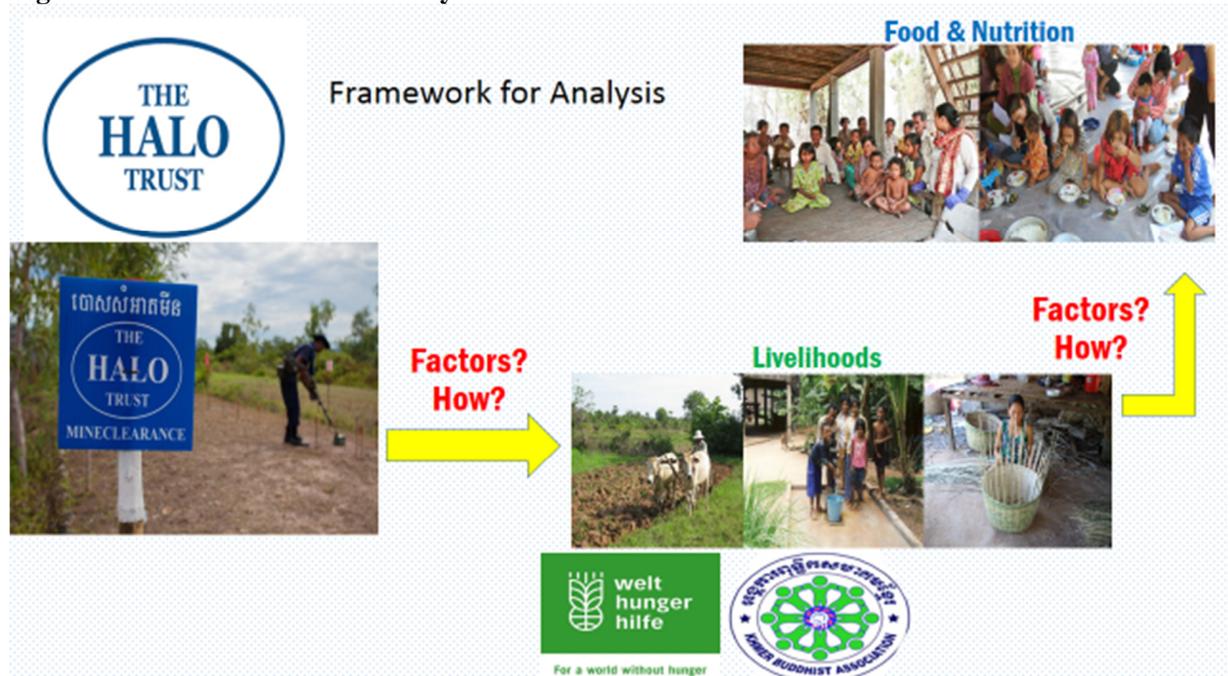
Table 1: Samples and Locations of Field Work: 16-21 Oct 2016

Commune	Trapeang Tav		Thlat	Trapeang Prei
Village	Tumnop (KBA+HT)	Trapeang Tav (HT)	Tuol Krous (KBA+HT)	Tuek Chop (KBA+HT)
HH Interview	8	6	7	8
Key Informant*	2	1	2	2
FGD	1	1	1	1
Total	11	8	10	11

*KI's Participants are Village and Commune Chiefs

- d) **Impacts Analysis.** The analysis focused mainly on the impacts of demining operations of HALO Trust and/or activities of KBA on livelihoods, and food and nutrition security. Key indicators of impacts on livelihoods include agricultural production, household income, condition of housing and other assets, land ownership and value, public safety, and access to infrastructure (i.e. roads, wells, schools, hospitals, etc.). Improved physical and financial access to health care services, clean drinking water, and sanitation as well as better understanding and practices of nutrition-related aspects such as hand washing, nutritious crops, healthy cooking practices, dietary diversity, etc. which are considered to be having significant impacts on nutrition and are used as indicators for the analysis.

Figure 3: The Framework for Analysis



1.4 Scope and Limitations of the Study

This study was confined to three communes in Anlong Veng District, Oddar Meanchey: Trapang Prei, Trapeang Tav and Thlat. Out of the 11 target villages, four (4) villages were selected (Tumnop, Trapeang Tav, Tuol Krous, and Tuek Chop), and divided into two groups: (a) Treatment Group (i.e. with HALO demining and KBA agricultural, nutrition, savings, and health activities); and (b) Control Group (i.e. with HALO demining only). Therefore, the study may not capture all and every aspect of the impacts in all the target locations and beneficiaries.

2. REVIEW OF KEY EVIDENCE/ISSUES FROM LITERATURE

2.1 Logical Linking: Mine Clearance, Livelihoods and Food/Nutrition Security

There is no specific literature or theories of change on the linkages between landmine clearance, livelihood, and food and nutrition security. The correlated factors and impact are very much dependent on the nature of the landmine contamination, nature of land, landmine type, infrastructure, clearance arrangements, participation of the local communities, efforts and investment by the government, and development activities, etc. While this study focuses only on the first pillar with some reference to the second pillar, according to the IOD PARC 2012, there are "five pillars of mine action" including:

- 1) **Mine Clearance:** removing and destroying landmines and explosive remnants of war and marking or fencing off areas contaminated with them.
- 2) **Mine Risk Education:** education on the risk of mines to help people understand the risks they face, identify mines and explosive remnants of war and learn how to stay out of harm's way.
- 3) **Victim Assistance:** medical assistance and rehabilitation services to victims, including job skills training and employment opportunities.
- 4) **Advocacy:** demanding and advocating safety regarding the threat of landmines and encouraging countries to participate in international treaties and conventions designed to end the production, trade, shipment or use of mines and to uphold the rights of persons with disabilities.
- 5) **Stockpile Destruction:** helping countries destroy their stockpiles of mines as required by international agreements, such as the 1999 anti-personnel mine-ban treaty.

In the context of Cambodia, it has been observed that the impact of landmine clearance on livelihood include: improved safety and access to private and public goods such as household land, public places, schools, etc.; increased land for agricultural crops and other investments to enable more income generation opportunities; improved availability of grazing space for cows and buffalos; improved ownership of land holdings and increased community participation; availability of land for housing, schools, recreation spaces, sports, markets, food accessibility, food utilization, and food stability.

Figure 4: logical linkages: landmines → livelihoods → food and nutrition security



By international standards, there are four dimensions of food and nutrition security. Accordingly, EVALUATS has also used the same guiding premise in assessing the impact of landmine clearance on food and nutrition security, defined as: i) **Availability** - through providing more land for agricultural production, distribution, and safe access to common property resources; ii) **Accessibility** - through both direct and indirect impact on food access by increasing income of people (e.g., agricultural production/sales and/or employment) and enhance capacity to purchase food items. The indirect impact of food access by improving infrastructure to ensure better market access; iii) **Utilization** - by improving understanding of and physical access to nutrition, health care services, clean drinking water, and sanitation; and iv) **Stability** - by providing regular, safer access to agricultural land and common property resources, and more secured income generation opportunity.

2.2 Reflections on Evidence-Based Coherence and Linkage: Demining and Food and Nutrition Security

The impact of landmine clearance on livelihoods and food and nutrition security varies depending on land use planning and management, household and community capacities to manage and invest in the released lands as well as supporting services and infrastructures. There are various factors and their level, as well as the process toward impacting the livelihoods and food and nutrition security, are different. In many cases, landmine clearance efforts are complemented with different development services which have both direct and indirect impact. The direct impact is basically on households engaged directly with the project such as receiving land, participating in training programs on how to properly grow agricultural crops, processing, and marketing, etc. Indirect impact is usually associated with the use of public goods such as access to roads, schools, and public safety, etc. However, the assessment and analysis of the impact on food and nutrition security are hardly available. Below are some practical experiences and evidence from studies.

The benefits of landmine clearance are unevenly distributed. An early study conducted by the Center for Evaluation (EVALUATS) established a strong relationship between landmine clearance by Mine Advisory Group and livelihood of the beneficiaries. The benefits at the household level include increased agricultural production and household income, improved food security, improved housing, increased commercial value of land, better access to markets and social services, and improved safety for individuals on their own land. The impact is substantial for the communities as well, including safety, access to common property resources such as water, roads, public spaces, and markets. Also, it was found that households benefit from landmine clearance unevenly, the households with more and better quality land together with higher capacity to invest in agricultural production and other activities will tend to benefit households with fewer investment resources.

According to Mine Action Coordination Centre of Afghanistan (2012), the impact of landmine clearance has been significant in Afghanistan. The livelihood Analysis of Landmine/ERW affected Communities: Badakhshan Province, Afghanistan, September 2012, confirmed the impact of landmine clearance including saving lives, encouraging refugees to return to their villages, enabling them to cultivate their land, tend animals, collect fire wood, build houses, schools and clinics, free from fears, as well as creating opportunities for implementing development projects. Clearance enables a wide range of land and non-land activities and employment opportunities and encourages internal and external investment. It also enables the building of schools, and safer access to schools for children and teachers.

Communication is among the key factors that maximize the impact of landmine clearance. An evaluation undertaken in the Lao People's Democratic Republic in 2015 by Durham, J., Nanhthavong, V., and Sychareun V., identified two main mechanisms through which the mine clearance program contributes to improved livelihoods: first, communication pre- and post-clearance; and second, the delivery of the product (cleared land). This study highlighted the context, dynamics, and how and why mine clearance actions contribute to livelihoods.

Landmine clearance is a pre and necessary condition for development. The Meta Evaluation of Mine Action and Development study in 2012 by IOD PARCH suggests that landmine clearance is a critical first step to stimulate investment, but it does not kick-start development - "clearing an area for use is essential to preventing civilian casualties but does not, without linked development intervention, necessarily lead to economic or social development. For example, where demining and land clearance returns key service infrastructure to the local population (e.g. access to roads, wells and service infrastructure) but the wider financial/planning/enabling environment is not in place to make full use of them". The report also indicates that development does not take place automatically, efforts are needed to make it happen by working with local people combined with investment in infrastructure, capacity and development of value chains.

2.3 Strategic Frameworks of Welthungerhilfe, HALO Trust, and KBA

2.3.1. Welthungerhilfe Framework of Operation

WHH activities in Cambodia started after the fall of the Khmer Rouge regime at the end of the seventies, focusing on short-term humanitarian aid. In 2002, WHH officially launched its work in Cambodian agriculture, food security, and human rights. Since 2008, WHH has worked exclusively through partner organizations, with the aim of building capacity and strengthening civil society organizations. KBA is one of four independent, well-established partners of WHH in Cambodia.

Adopting a rights-based approach, WHH's work in Cambodia focuses on food and nutrition security and the promotion of civil society actors to influence the root causes of hunger and poverty.

Since 2010, WHH and KBA have worked together to improve livelihoods and food and nutrition security of the poorest families in Anglong Veng district, Oddar Meanchey province of Cambodia with the support from Irish Aid. Key activities implemented include training and providing support services for agriculture production, vocational skill training and start-up support for small businesses, forming self-help groups and the establishment of farmer cooperatives. Particularly, in 2015 WHH supported (together with Irish Aid and Happel Stiftung) KBA to implement a project called "Giving Voice to the Unheard: Strengthening the Political, Socio-Economical, and Nutritional Status of Poor Families in Oddar Meanchey Province." aiming to benefit 740 poor families in 11 target villages.

2.3.2. HALO Trust Operation in Cambodia

Since 1991, HALO's dedicated Cambodian staff have been clearing the debris of war in the country. All of HALO's survey, landmine, and Explosive Remnants of War (ERW) clearance and Mine Risk Education (MRE) activities are undertaken by the team in Cambodia. While considerable mine clearance has been undertaken, a recently completed countrywide survey confirms that there is still much work remain to be done. HALO Trust estimates that, with a large segment of the "K5" border minefield remaining and at current clearance capacity, it will take over 14 years to remove landmines in Cambodia (HALO Trust Donor Report, 2014).

Rural families suffer disproportionately from the presence of mines because most are living near subsistence level and are dependent upon the land for food (farming and foraging), shelter (thatch and building materials), income (cash crops and forestry) and water. Mine clearance remains a vital prerequisite for many of the activities required to lift rural communities out of poverty, such as the creation of basic infrastructure and improvement of agricultural and food security.

After over two decades of mine clearance in Cambodia, HALO Trust has removed over a quarter of a million

mines with significant reduction of the number of casualties, employed more than 800 Khmer men and women. By 2013, HALO Trust had cleared 7,127 mines from 318 minefields and released 1,186 hectares of agricultural land to rural Cambodian families. Also HALO Trust cleared 10,614 other items of explosive ordnance (HALO Trust Donor Report 2014).

2.3.3. KBA Intervention to Demined and Non-Demined Communities

On 15 October 2015, the Khmer Buddhist Association (KBA) started the project “Giving Voice to the Unheard: Strengthening the Political, Socio-Economical, and Nutritional Status of Poor Families in Oddar Meanchey Province.” This Project is funded by three donors: Irish Aid, WHH, and Happel Stiftung, and runs for 18 months from October 15, 2015 to April 15, 2017. The project will try to support civil society to effectively advocate for the rights of poor families to contribute to poverty alleviation and hunger elimination in Oddar Meanchey province; and will empower 740 poor families in 11 target villages so they are able to exercise their rights to enhance their political, socio-economic and nutritional situation (KBA, Sept. 2016).

3. FINDINGS, DISCUSSION AND ANALYSIS

This section presents the main findings from the field and the analysis of impacts resulting from demining by HALO Trust and/or development services by KBA on livelihoods, and food and nutrition security. As for the impacts on livelihoods of the households and communities, the findings capture both circumstances, before and after the demining and development services. The discussion and analysis of the impacts on food security and nutrition by reflecting on the four (4) dimensions of the Food Security and Nutrition; and followed by the discussion about the impacts of mine risk education. Other areas such as (a) ownership aspects and their impacts on on-farm and off-farm for livelihood strategies and diets; (b) the impacts of land use planning/management on access to land for agriculture; and (c) people's power in influencing the commune and district-level development processes, are also discussed.

3.1. Impacts of Demining by HALO Trust and Interventions by KBA on Livelihoods and Food and Nutrition Security

3.1.1. Impacts of Demining on Livelihoods

In order to establish the basis for comparison, this section discusses both the situation before and the impacts after mine clearance by HALO Trust and activities by KBA on the livelihoods. The reflection of key impacts by mine clearance of HALO Trust and/or KBA's activities are presented in part (b).

a) Status of Livelihoods: Before Demining Operations

"We are very much dependence on farming activities, but my family and my home are surrounded by landmines. We live in fear, I don't allow my children to run/play around too much. I have no choice but to take risk growing some rice on the landmine-contaminated areas in order to provide food for my family."

Said Mr Ron Chin, Trapeang Tav Village, Trapeang Tav Commune.

These statements suggest that land is viewed not only as a source of livelihood through various agriculture productions, but is also considered to be a form of security that fosters a sense of belonging. Nearly all of the villagers who participated in the FGD and household interviews identified themselves as farmers who needed sufficient land to grow enough rice and other crops to sustain their families throughout the year. For the participants in the FGD and household interviews, this represented the importance of family to his wellbeing, and highlighted the key role that land played in sustaining close relationships.

- ✓ ***Contaminated landscape before demining.*** For many rural people living in the villages visited, life was hard as they must sustain a living through subsistence farming by risking their lives with minefields. Before demining operation, the families living in the villages depend on agriculture for livelihoods, and many run the daily risks of living and working on contaminated land areas. Talking to the villagers during FGD and household interviews gave the study team an insight into their lives before any clearance had taken place by HALO Trust. The villagers identified two main effects of landmines: landmine accidents and the effect this has on individuals and their families, and the difficulties of living with the continual presence of mines.
- ✓ ***Land mine accidents.*** There were a number of people living in the villages visited by the study team who had been injured and lost limbs as a result of landmine explosions. According to some

participants in the FGD, showing no outward sign of weakness was important for some victims of explosion. One participant narrated the experience of one farmer that had been travelling through the forest with his son when the ox cart he was driving ran over a mine, detonating it, injuring both himself and his son. According to other participants, the farmer's right leg was badly injured, and he was taken to the hospital in Battambang by some of the other villagers. To pay for his medical treatment, he and his wife were forced to sell all the timber he had cut down to build a more substantial house, their livestock and nearly all their possessions. Having spent nearly two years in and out of hospital, the farmer then moved back to live with his family in a former residence within Battambang province. One of the participants said that:

“There were mine explosions nearby my lands, and I also know that some parts of my land plot were contaminated. And so I had never used it for fear of our safety.” said Ms. Heang Ly, Toul Kruos village.

- ✓ **Living in fear:** There is little doubt that living with the continual presence of landmines places an inordinate psychological strain on people that colors every facet of their daily lives. All of the villagers interviewed by the study team talked about how afraid they were living in the village before any mine clearance had taken place. The fear was on different levels and encompassed anxiety and worry about the presence of landmines as well as trepidation about living in the forest. The mines threatened the safety of individuals, their families and their livestock.

“Before, even when I was asleep or was walking, I was always thinking about where I could go because if I went this way there were mines, and if I went another way, there were mines there too. I thought that when I first came here that it was very difficult. I couldn't go out to work for someone else because I was afraid. I was afraid of the landmines.” (Female participant in FGD)

Maintaining the safety of children was another issue for many of the villagers. A number of villagers explained that they tried to keep their children close to home to stop them from being injured by mines, but this was not always possible. The landmine literature documents that many cases of landmine accidents are a result of children's innate curiosity to touch and play with objects they find. This was supported by a number of people interviewed who spoke about finding and playing with mines when they were younger.

- ✓ **Struggling to survive.** Many had been migrants who seek alternative income in the neighboring communities and nearby provinces with few belongings, while others had travelled across the country with only the possessions. Standards of living were therefore low and they were reliant on themselves to carve out a living in the hostile environment of the forest. Accessing basic amenities such as water and food were major concerns for most villagers, who spoke about the dangers they faced on a daily basis and the calculated risks that they took going into suspected hazardous areas in order to survive. Several villagers spoke about the difficulties they had collecting and keeping sufficient water to drink, wash and cook with:

“Before it was difficult to live here. I wanted to go back because it was difficult for water and for everything. Even food was difficult.” (Female participant, FGD)

b) Livelihood Improvements/Status: After Demining Operations

HALO Trust has achieved great success in clearing and releasing land and thereby contributing to improved safety, reduction of accidents, and enabling the beneficiaries in the four villages studied to have an increased access to land for agriculture and income generating activities such as collection

of non-timber forest products. As of October 2016, the total area cleared by the HALO Trust for the four villages reached 219.27 ha, which accounts for 53% of the total land area cleared for the 11 target villages. The benefits for the households and communities from land mine clearance are significant across the four villages/communities including increased agricultural production by having access to more land plots, improved household income from better and safer access to alternative income sources and infrastructure improvements, increased commercial value of land, improved housing, better access to markets and social services, and improved community infrastructure. The increase in land value has enabled some households to more easily access commercial loans which can be used to invest in agricultural production.



Left and Right: Land Cleared by HALO Trust and Handed Over in Trapeang Tav commune

Throughout the FGDs and household interviews, it was evident that there is a very positive attitude that exists amongst the beneficiaries towards the land cleared and released by HALO Trust, and towards the agricultural training provided by the KBA after the handover of the land. Many FGD participants indicated that timing of land handover/release is crucial to enable households to timely benefit from planting and harvesting seasons.

Mr. Vin Son, the 63-year old Village Chief of Tum Nob, Trapeang Tav commune is highly appreciative of HALO Trust demining operations. He indicated that farming, fishing, and forestry activities in the village became normal after almost one year after the completion of de-mining operation within the radius of 15 meters along the old road alignment. He claimed that market value of the land has increased from \$100 per hectare to about more than \$2,000 per hectare. Production in the farming and fishing in the village has helped improve livelihoods of the significantly. Access to the market has improved with reduction in transportation time from 45 minutes to just 15 minutes in the nearby market of Tuol Svay resulted from safer and better road. He further said that better access to education and health was also attained because of demining in the community.

✓ **Mine Clearance Means More Lands for Agriculture and More Incomes**

With HALO Trust's operations, people have access to more land for agriculture. As indicated above, 219 ha of land has been released and handed over to the four village communities most of which were used for agricultural production by the beneficiaries interviewed, and therefore improving the livelihood conditions of the people in the areas. Almost all of the households visited engaged in agriculture, and mine clearance means more lands for agriculture and more income for the people.

Mr. Pean Lonh, of Trapeang Tav village, Trapeang Tav commune, indicated that HALO Trust and local authorities came to talk to him and his wife about the clearance plan, and "I was so happy when

we discussed about mine clearance as I could expect more land for agriculture and less safety concerns". Soon after the contaminated land was cleared and handed over, he started growing cassava fully in 2 ha together with some fruit trees. Compared to last year when only 1 ha had mine clearance by HALO Trust, this year he is expecting up to 30 tons, which is double compared to last year. Mr. Lonh, who used to sell his labor for 15,000 riels per day to neighbors, is no longer doing that because more labor is needed to work on the expanded land. With more land plots and procession of ownership, his family is able to borrow 3,000,000 riels from a Microfinance Institution (MFI). Another example, Ms. Ly Sun Leng, of Tumnup village, said that with more income from selling cassava, she is now able to pay back her loans and interest.

A household in Toul Krous Village indicated that "After mine clearance, farmers could go to forest and collect more dead tree (poll) and firewood, bamboo, mushroom, wild jelly. Because of safer access, people now can collect these products 3-5 times per week compared to just one time before mine clearance."



Left: Vegetable Garden and Cassava Production (Right) Being Grown on the Lands Cleared

The same positive reflection of HALO Trust demining activities was also confirmed by Mr. Thlang Sin, Trapeang Tav Village Chief of Trapeang Tav Commune. He said that after clearance, around 20 farmers in his village have diversified and expanded their farming activities by transforming land areas used to be contaminated by landmines into production areas with the harvest of 1.5 tons of rice per ha and 10 tons of cassava per ha. For example, a male farmer in Trapeang Tav village noted that:

"I have a very good livelihood because I can produce more rice after land clearance. I expanded another 3.7 ha of the clearance and to be used for cultivation next year. Now I can use my tractor on the land and expand the cultivation more than before, including mango and rice cultivation."

With more land, more households reported to have more income for their household. Income usually comes from different sources, such as through selling agricultural products and collecting of forest products (known as non-timber forest products). For example, most of the household interviewees and FGD participants across the four villages reported to have increased their yields of cassava and rice, and thus generated more income. In addition, Ms. Roemun Hov, of Teuk Chup village, Trapeang Prey commune, reported that because of more accessibility to roads and forests to collect bamboo shoots, she and her husband can now collect up to 200-300kg of bamboo shoots and wild potatoes per day compared to only around 100kg per day previously.

✓ **Collaboration Between HALO Trust and KBA Produce Greater Results**

The comparative analysis with HALO Trust only and between HALO Trust and KBA showed that the two organizations complemented each other well in impacting livelihoods, food and nutrition

security. While HALO Trust cleared and provided safe land to households maximizing land productivity depends on the households' capacity and resources to invest, which is a major issue faced by most of the poor families in the four villages studied. Therefore, KBA agriculture-related skills trainings were perceived by the households interviewed as an important catalysts to augment productivity.

Interviews reveal that the application of agricultural practices and techniques taught in the trainings contributed to boost household productivity which include early preparation of fields (in order to utilize natural maneuver and saturate the soil), planting in rows (rather than broadcasting), weeding, seed-multiplication, awareness about seed recovery and knowledge about field layout that enables increased yield and avoiding cross-pollination. In some groups, the FGD participants reported that:

“Members take the knowledge home and grow the crops as they have been taught.” In others “there is rotation in the agricultural work whereby in everyone’s fields, the modern practices are applied”. (Male and female participants in the FGD in Tumnuop village)

“KBA was very instrumental in making my bountiful harvest. Because of the seeds and farming tools provided to us in the community, we were able to get enough income from agricultural production, enabling us to have enough money to buy other household stuff,

aside from meat and fish from the market.”

(Female participant, FGD)

“In order to ensure more access to food in the house KBA should continue providing agricultural extension services, aside from the provision of seeds and farming tools.”

(Male participant, FGD)

The same evidence was also provided by Mr. Vin Son, Tumnob Village, Trapeang Tav Commune who said that food conditions and livelihoods of households in their village have greatly improved through the combined efforts between KBA and HALO Trust. After handing over the cleared lands to households or communities, KBA provided trainings on vegetable growing techniques, chicken/pig/cow/duck raising, rice farming, and other livelihood skills, which are crucial for agriculture production and other income generation activities. He also said that the saving groups organized by KBA appeared to be successful in helping community members to save or borrow for various investments though the average loan size was very small at the beginning ranging from 20,000 to 40,000 Riels. He added that given the ability to maximize productivity and maintain good yields, the villagers now can afford to send their children to schools in Anlong Veng for grade 10 and above, and in many cases are able to afford proper health care in private clinics. He also said that more and more people are able to afford to buy motorbikes, and hand tractors to be used for farming and transportation of their rice, cassava, vegetables, and other produces from their farms to the nearby markets, which is about 8 km away.

“With land cleared and released by HALO Trust and being used for agriculture, the trainings on agricultural production helped increase productivity greatly; and with a safer access to infrastructures and other income sources, the living conditions of my family are now much better.”

Said Ms. Uth Thy in Tuol Kruos village.

✓ **Mine Clearance Stimulated Infrastructure and Community Improvements**

Improved and safer access to roads, public spaces and common properties such as non-timber forest products, and water are critically important for households. Demining activities in the region have been instrumental for infrastructure improvements to take place. These include building more substantial earth roads that ran through the villages, public spaces improvement, and several ponds

and wells were constructed by the government and donors. For example, better access to both public and private ponds and wells is crucial not only for livelihoods i.e. sufficient water sources for agriculture production but also for improved nutrition through application of WASH and WASH related nutrition practices such as the use of clean drinking water, and hand washing. During the FGD and household interviews, the villagers expressed their gratitude to HALO Trust and reported that their lives were much better now that clearance and development had taken place. As several villagers conveyed during the FGD:

“Now it is much better than before because we have a road. When the road was extended, more and more people came to live here, and there are a lot of people here now so I feel happy and warm.” (Female participant, FGD).

“Now we are not afraid and we don’t worry about things. Now we have a road, we have a pond, we have a school and the village has started to develop. If you talk about living in our village now, it is not bad. Even if we walk or go somewhere, it is not difficult like before.

It has changed a lot.” (Female participant, FGD).

“HALO Trust has cleared all the landmines and we have a road, a pond and we don’t have a shortage of water anymore. Compared to the past, it is much better now; we are no longer worried about the landmines \, even in the rice fields.”

(Male participant, FGD).



Left: Water Pump, and Mobile Water Cart in Trapeang Tav village (right).

From the villagers statements it can be seen that combined clearance and development services has improved their lives and wellbeing through increased productivity and sustained access to diversified income sources. The better and safer roads facilitated an easier access to the markets for farmers across different communities in the region to sell their crops and also buy essential goods in the neighboring villages and communities. Often times farmers face pricing issues due to product quality and limited market information; however, access to multiple markets enabled the farmers to cope with it more effectively. Road infrastructure investments (following landmine clearance) greatly contributed to improve production and market connection, and ultimately led to improved living

conditions of the rural poor Cambodians.

✓ **Mine Risk Education Helps Mitigate and Reduce Burden on Household Livelihoods**

Lack of education about landmines put rural residents (particularly children) in mine-affected areas in great danger and create an enormous burden on their livelihoods, especially when accidents happen, causing the death or disability of family members. According to information obtained from HALO Trust and from the field, in Anlong Veng, Oddar Meanchey, a total of 140 mine risk education (MRE) sessions were undertaken as of October 2016. HALO Trust's MRE teams conducted the information campaign mostly in schools since the majority of landmine and ERW casualties are children.

The typical lessons for MRE in the village include what villagers should do when going to the rice field, how to dig the hole in the rice field, how to clear their land for framing, how to cut the grass, what are the signs of the landmines or UXOs, to whom and where to report to, etc.

Mine risk education programs (MRE) by HALO Trust have played a key role in mitigating and reducing risks on the livelihoods. The participants interviewed said they received information regarding UXO through mine risk education programs, the village chiefs, and family members. Participants in the focus groups suggested that mine risk education sessions ran for a whole week in one area/village before moving on to the next. The majority of participants interviewed recalled some of the techniques and tools used by HALO Trust's community awareness raising team. As one of them said:

“

The mine risk education was perceived by the people interviewed significant factor contributing to strengthen communities, reducing the risk of death or injuries in mine or UXO incidents, and supporting mine clearance and marking mine action activities more meaningful and beneficial. The targeted participants and key messages were really important in maximizing impact.

3.1.2 Impacts on Food and Nutrition Security of the Households

This part presents the results and analysis of the impacts of demining activities on food and nutrition security. Information and evidence from focus group discussions held separately in each of the four villages complemented by at least 29 household interviews are used to support the discussions and analysis. This qualitative data allowed significant insights regarding food and nutrition security of households before and after demining operations. The food and nutrition security dimensions are defined by availability, accessibility, utilization, and stability - the dietary element is also discussed.

3.1.2.1 Food Availability

In the context of this study, food availability is defined by improved agriculture production such as having more land and inputs, improved agriculture production skills, access to safe roads and water, and improved access to community assets (public spaces, water, non-timber forest products (NTFPs)).

The study found clearly that HALO Trust's demining activities expanded the land available for agricultural production and provided safer access to different places across the communities which were really helpful for the movements of agricultural inputs and produce. The demining activities also paved the way for small infrastructure investments and safer access to common property resources such as fisheries and forests (for example bamboo shoots, firewood, rattan, etc.). For example, as a result of mine clearance by HALO Trust, Ms. Roenun Hov of Teuk Chup village reported that, because of better access to roads and forests, she and

her husband can now collect up to 200-300kg of bamboo shoots and wild potatoes each day, compared to only around 100kg per day previously.

The same experience was reported by Ms. Uth Thy of Tuol Kruos village stated that her and her neighbor feel very safe to move around the village and community, collect firewood, and reap 2 to 3 times more than before mine clearance. While Mr. Pean Lonh of Trapeang Tav village responded that he now cultivates cassava on 2 ha with an expected yield of 30 tons, compared to only 1 ha before mine clearance. These impacts not only help with more food but also income which can be used for other purposes such as sending children to school and better cope with issues such as diseases and seasonal food shortages. In other cases reported by the households value of land increased after clearance. Ms. Sin Pheap of Tuol Kruos village said that "the price of my land cleared by HALO Trust has increased to \$2,000 per ha."

Inputs such as seeds and farming tools and training provided by KBA were highlighted by all interviewees as enabling factors to increase agricultural productivity. It was observed that the beneficiaries of KBA responded well to information about modern agricultural practices. These practices include: early preparation of fields (in order to utilize natural maneuver and saturate the soil), planting in rows (rather than broadcasting), weeding, seed-multiplication, seed recovery, and field layout. Implementing these practices has increased yields and avoids cross-pollination. The different groups used various strategies such as peer observations/learning, formal and informal sessions to share experiences and practices to spread the use of these practices.



Left: Water containers and drip irrigation. Center: Vegetable gardens, and rice fields -Tuol Kruos village (right).

The FGD participants also indicated they had been trained in post-harvest handling practices and that a stronger focus on storage facilities in subsequent project cycles would help. This would ensure that agricultural outcomes have the desired impact on food security, as reflected in comments from villagers in the FGDs:

“Before, food produced in one year would never reach the next year. Learning how to handle it, how to conserve it, makes it easier to store food up to next year”. (FGD participants, Tuol Kros Village)

From the household interviews, FGDs and KIs, it was clear that demining activities helped rural poor families produce more food by making the contaminated land accessible and usable. In many cases, the activities led to several infrastructure investments (mostly small ones) of both private and public/community assets which greatly facilitated agricultural production and safer access to various places within the communities. In addition, KBA's trainings in good agriculture practices enabled farmers to maximize productivity and thereby expanding production and sustaining foods for rural households.

3.1.2.2 Access to Food

Improved food access comes from being able to generate more income directly through agricultural production and sales, or indirectly through employment by working on farms and off farms which then leads to increased purchases of food and dietary diversification. Improved and safe access to infrastructures help facilitate market transactions for agriculture produce which could indirectly lead to better income as well.

HALO Trust demining activities played an important role in facilitating safer access and expanding land, boosting production, thereby generating incomes through the sale of agricultural produce and on-farm as well as off-farm employment. More land for production creates more on-farm employment opportunities thus generating more income for the households. As Mr. Pean Lonh of Trapeang Tav village states, *"In addition to doing our own agriculture cropping, my wife can now provide her casual labor to our neighbor seasonally for 15,000 riels per day"*.



Left: One mother proudly stands in front of the drip-irrigation system that increased vegetable yields for sale, for sales, thus increasing income.
Right: Demining helps families to grow crops and sell at the local market, Tuol Kruos village.

A number of other examples of spill-over effect was also observed in the villages which is also important to enable food access. The introduction of new KBA's agricultural practices in selected communities, like planting in rows, is reported to have affected the division of work and cooperation between men and women as the methods require cooperation and equal participation of household members. Improved cooperation among the genders has resulted in increased efficiency and productivity and thus generated better income for families. The study team found that women neighbors express their strong interest to follow the same methods and practices as greater results achieved which led better foods for the families. Furthermore, as one FGD participant reports:

3.1.2.3 Food Utilization

Better food utilization is particularly driven by the understanding of the importance of nutrition, safe drinking water and sanitation and health services which particularly influence child nutrition. Lack of access to drinking water, hygiene and sanitation will most likely cause illnesses and infections, and negatively affect the nutritional status of vulnerable children and households. The trainings delivered by KBA on nutritional promotion and hygiene practices were relevant in encouraging a better use of food. Ms. Chuob Pok in Teuk Chup village, Trapeang Prey commune is an example of the impacts of the training by KBA. She received the nutrition session which focused on food cooking demonstration, and enriched porridge for young children. After the training Ms. Pok tried to practice and prepared enriched porridge for her child once or twice per week. Her child likes to eat the complementary foods she prepared and she observed that the child is healthy. She also advised other mothers to do the complementary food for their

children.

On the other hand, HALO Trust demining activities not only help farmers to have more foods but also enable them to have better quality drinking water and improved infrastructures. More plots of land cleared and released by the HALO Trust for agricultural production increase food availability and accessibility. And some of the public and community plots cleared and released were turned into community and private ponds, wells, and community school buildings to be used by the local people. Through these ponds and wells, rural households now have a better and reliable access to water for household's consumption, particularly for drinking and hygienic sanitation purposes. The community schools are generally used by the communities and NGOs for trainings including those related to nutrition.

Findings have also revealed the strong involvement of women in the activities of vegetable growing and drip-irrigation that were recently introduced by KBA in the four villages resulting in more and more households implementing home gardens which enabled to improve their food consumption and diversify diets. These are very important for the health of mother, pregnant women and children as most of the produce from the home gardens are usually for household consumption. As stated by an FGD participant,

“Many women engage in home gardening and they also take part in decision making for utilization of income generated by or consumption of vegetables from home gardening, either for food or other household expenditures”.

Ultimately, better understanding of the important of nutrition, hygiene as well as being able to access more foods and safe drinking are expected to improve health condition and nutrition status of mothers and children in those villages and communities. In addition, drinking safe water complemented with good hygienic practices could reduce the risks of illnesses and other infection rate.



Left: Fish dried for consumption and sale. Right: A women was preparing a meal for her families in Tumnop village.

3.1.2.4 Food Stability

Food stability is defined by having regular access to agricultural production, common property resources, and more secured income generation opportunity. Limited access to land, ineffective land tenure arrangements and land use management, flood and drought could potentially cause food instability. With sustained and safer access to lands for agricultural production; roads connecting farms to markets; improved community spaces and infrastructures such as ponds, wells; and reliable diverse income sources such as NTFPs, on and off-farm employment resulting from HALO Trust's mine clearance together with KBA's supports in good agriculture practices there was strong evidence of a foundation for food stability in the villages and communities visited. In the FGD and household interviews conducted, while access to more and safer land are fundamental for increased agricultural production, there also appears to be increased awareness of basic income-enhancing strategies, like selling when prices peak and seeking varieties of income opportunities include off-farm ones which equip farmers with greater financial ability to deal with food shortage, sickness, and different shocks.

The initiative of forming farmer or savings groups to connect and coordinate different agribusiness activities

to leverage market and price opportunities for their produce has been well perceived by the rural people as it helped facilitate and share information about prices, crop rotation, loans, etc. For example, one farmer group leader explained:

“The group stores the bulk production until prices go up in February-March, and this process of planning is new.” (Male farmer/savings group leader, FGD in Trapeang Tav)

The practice is further illustrated in another household interview:

“When we have enough agricultural produce, one representative from the group is responsible for facilitating the contact with a buyer. This practice is new; before it was an individual issue to go to the market”. (Female household interview, Trapeang Tav).

3.1.2.5 Local Diet in Demined Communities:

Healthy and diverse diet is fundamental for nutrition. Health diet is about the capacity of the family being able to have knowledge about and consume diverse and nutritious food. An important pre-condition to the project’s potential impact in contributing to increased dietary variety is whether it has been successful in facilitating and stimulating more diverse agricultural production which could lead to more food options for households. When responses are reviewed at the village level, it was observed that beneficiaries of KBA account for the majority of villagers that have had increases in crop variety. As one participant in FGD said:

“Because of the technical assistance in agricultural production by KBA, the local diet in our village has changed. Before, we are just eating rice with salt and some vegetable. But because of the increased in income from agricultural production, the food consumption at home has changed to a balanced-diet meal such as rice, fish, sour soup with pork, and some fruits. We hope that we will continue this kind of meal at home with more agricultural inputs assistance from KBA.”(Female participant, FGD)

The beneficiaries of KBA expressed great satisfaction with rice and vegetables, which has been very successful both as a source of improved household diet and income. The depth of the success is indicated by beneficiaries stressing that learning how to produce seeds for a new type of crop is vital in order to sustain production.



Children in Tuol Kruos village have greater access to food diversity and benefit from increased agriculture production and income.

KBA training on nutrition was very useful, particularly in advising on food selection and preparation. In Tumnuv village, participants received training on nutrition and how to enrich porridge, complementary feeding practices, breastfeeding, food groups, and information about foods that are good for small children. In household interviews respondents were asked about their general understanding of nutrition and to

estimate how many days in one month they included different types of food in meals. Most of them indicated that because of the cooking demonstration training conducted by KBA, they are now able to make porridge with meat, as well as cook more vegetables every time the family eats. However, the responses show that the main menu is still comprised of carbohydrates, vegetables and beans/peas, and rarely includes meat, fish or poultry.

3.2. Impacts of Ownership Aspects on On/Off-Farm Livelihood Strategies

3.2.1 Impacts of Ownership Aspects of On-Farm and Off-Farm Livelihoods

From field observation, smallholder farmers, landless families, food insecure households, and rural youth are dependent not only on agriculture but also on off-farm employment opportunities. In Cambodia, on-farm jobs are those at the production level such as cutting grass, clearing/collecting forest, managing land, growing or harvesting crops. Off-farm employments are usually available at commercial farms or large scale agribusinesses nearby communities as well as processing factories or manufacturing industries or construction sites. Demining activities have contributed to both on-farm and off-farm income generation opportunities by expanding agricultural production and creating incentive for large-scale investments.

➤ Demining Creates On-Farm Jobs through Agriculture Expansion

The demining operation of HALO Trust in the four villages facilitated the expansion of agriculture production and the creation of on-farm employment. On-farm employment typically include working for neighbor farmers in the same or different villages and for commercial farm activities within the communities. It was a common notion among the villagers that individuals with lower levels of education, landless and poor people are likely to remain on the farm, while individuals with more education are likely to participate in stable higher-pay work. Participants estimated that on-farm income is about \$70 to \$150 per month as casual labor. The villagers also indicated that the program introduced by KBA, which involves capacity building of members in agriculture, formation of self-help groups for chicken-raising groups, pig-raising groups, and the formation of micro enterprises is crucial for income generation activities as well as well equip household members for various on-farm employments.

➤ On-Off Farm Employment and Its Impacts on Livelihoods

According to FGD and household participants, incomes are generally higher in non-farm sector (i.e., government jobs, the service sector, trade, mining or construction) with the average income between \$200 and \$350 per month. Participants said that these coveted jobs usually require a higher level of education or skill expertise. According to FGD participants and household respondents, during the demining operations, some people were employed by HALO Trust to assist in the process of ERW removal which generated income generation opportunity as well. Others were provided off-farm employment during the reconstruction of roads and other physical facilities. For other families that could not use their farmland, they were able to go to the forest to get timber, mushrooms, bamboo shoots, and other non-timber products. Others worked in nearby commercial farming communities which were either enabled by the demining activities or not affected by landmines.

➤ On-Farm and Off-Farm Works by Gender

Regarding differentiation of labor by gender, the study team learned that most men concentrate on agriculture and heavy manual labor that pays \$150 to \$220 per month, while women engage disproportionately in housework, child-rearing, animal care, and less labor-intensive roles, which pay about \$75 to \$170 monthly in nearby provinces. With these activities, both FGD and household participants expect the likelihood of male participation to be higher, particularly for low-pay off-farm work, given that

most of this work involves manual labor. Some participants suggested that females have much lower levels of participation in off-farm work in the agricultural sector. Girls in the villages visited tend to stay in school longer than boys, who often leave school to provide manual farm labor. This trend likely equips women with skills and credentials important for higher-pay off-farm work.

Collectively, the findings suggest a number of general conclusions. On-farm work is important for accessing off-farm work in the agriculture sector. This on-farm employment helps provide cash income for farmers for daily living standards. Better jobs give individuals and families both stability and more income which are key to attain secure livelihoods. This income from both on-farm and off-farm employment opportunities enabled rural farmers to better cope with urgent needs within their families such as illnesses or food shortages caused by natural disasters.

3.3. Land Use Planning/Management, People Power, and Livelihoods

3.3.1 Traditional Land Use Planning, Management

Land use planning and allocation began in the four villages in 1996-1998 which focused on land allocation to households for housing, agriculture, and community development, such as for schools, health centers, pagodas or community forests. In the past, village chiefs allocated both homestead land and agricultural land to each household and the amount of allocated land varied by villages. For example, in Tuol Krous village one household was reported to receive over 5 hectares (ha) of land for farming together with 25m by 300m of homestead land, but in Trapeang Tav, people reported they were allowed to acquire only 40m by 70m of homestead land, 3 ha of rice fields and 2 ha for other crops.

Land allocation was also prioritized for those people who moved in and resettled in the village earlier. The former military of Khmer Rouge families who originated in the area were often the ones who occupied a lot of land. However, later several external migrants from other provinces such as Siem Reap, Prey Veng, Battambang, and Kampong Cham came to acquire and claim land as well. Those who came first could acquire more land, and late comers ended up in getting much smaller plots, or even had to purchase land.

Land allocation in the past also depended on the capacity of households to clear forestland. Some families with large members could clear from 4-10 ha of forestland and benefit from farming on the cleared land. In addition, the power and connection with village chiefs, local power holders, especially military groups, play key roles in acquiring land at that time.

Traditionally, local authorities did not provide any documents to ensure ownership of the land to people during allocation. Villagers usually marked their land's boundaries by clearing bushes. Some households used trees, poles, hills or fences to mark their boundaries. One family reported digging a small canal around their land. As for purchasing or transferring land, villagers often did it through a written or verbal agreement in front of their village chief and witnessed by their neighbors.

Traditional land use planning contributed to the current food security and nutrition status in rural Cambodia. The past land distribution has determined the status of agricultural land holding, and common properties. Local power, networks and relations have influenced the traditional land use planning, and as a consequence, some people have acquired more land than the others. This also explains why people have different levels of control over and utilization of land for food availability and stability.

3.3.2 Status/Issues on Land Rights and Disputes

Land disputes and conflicts became more visible across the four villages in 2000s and early 2010s between households, between households and local authorities (e.g. village chiefs), between households and military officials or external powerful/rich people, or between households and foreign companies. This was mainly due to constant inflow of migrants coming to settle in the village as well as potential commercialization and businesses. Villagers also reported increased prices of land during the period and the existence of big

businessmen and companies arriving to purchase land in large scale for commercial farming or Economic Land Concessions.

Land conflicts vary among villages depending on their location and potential for economic development. For example, Tumnop village had low level of land disputes compared to other villages. A high prevalence of land disputes was found in Tuol Krous, where land disputes happened because of the rising of land prices after mine clearance. Before mine clearance there was no market for land in the village, but the land price started rising up to \$1000-\$3000 per ha after demining. In this village, some villagers were also pressured to sell their land at a low price to businessmen who then sold to a rubber plantation/cashew nut company (Vietnam-Thai Company) with steep price high. In Trapeang Tav, villagers reported the case of former village chiefs who sold the public land to people in other villages without their knowledge.

As found in this study, the local authority did not organize any training for villagers on property rights or help solve those land disputes. Some farmers found their own way to deal with land disputes by filing complaints to the court although winning such legal battle is far from reach for them.

Land conflicts affected the food and nutrition stability of local people. People lost their land used for food production, consumption and income generation as a result of the conflicts. The involvement of local authorities in grabbing or selling public land did not only disrupt food availability and accessibility of people, but also showed the failure of the state to address local issues. The above-mentioned cases strongly confirm that proper land governance at the village and commune level is required to ensure food and nutrition security and stability on the ground.

3.3.3 Resolutions to Land Disputes and Land Certification

Some efforts were made by the government to resolve land disputes and conflicts in some villages. For example, in Tuek Chop a certified land document was processed for people in 2003, while in Trapeang Tav this did not happen until 2010. With many land disputes related to Economic Land Concessions, the Prime Minister sent a team of student volunteers to identify landowners to process the land titles for the Ministry of Land Management, Urban Planning and Construction (MLMUPC). Tuol Krous was the only village in this study that benefitted from those interventions. At least 40 households who were direct beneficiaries of The HALO Trust receive their official land titles from MLMUPC.

There are still many challenges to issuing land certificates to local villagers. It was found that many villagers still did not have land certification and perceived it to not be necessary, or just for the purpose of getting a loan from MFIs. Processing land certificates by the commune was also costly even though the law requires no fee. In Trapeang Tav, villagers reported they had paid from \$15-\$125, while in Tuek Chop villagers paid only \$2.5 for the process.

Land certification is instrumental for reducing land conflicts and threats of eviction. Despite the government efforts to improve property rights of local people and to deal with land disputes, the problem cannot be properly addressed if the land certification arrangements are not transparent. In the absence of clear and transparent processes, land registration will not be successful in safeguarding the property rights of people and in ensuring land utilization and food security.



Barang road in Trapeang Tav village, where a lot of land conflicts has occurred

3.3.4 People Participation and Influencing on Villages, Communes and District Development Planning

Several community meetings and activities are conducted at the village and commune level, which require people's participation and include the village and commune meetings for the Commune Investment Plan (CIP). About 25 people per village are often selected as members of their respective villages for the discussion on development planning and budgeting. The commune councilors usually have the interest to validate the data/information to ensure the process was inclusive and reflecting the priorities by conducting a separate meeting with general villagers. Traditionally, according to village chiefs and commune chiefs, the level of participation of villagers in those meetings was still limited, as people often claimed they were busy with their own farming and living activities, and so they did not often attend. Sometimes villagers sent their children to attend the meetings on their behalf.

However, the reaction of people towards the village and commune development planning has changed. Despite low participation in attending the meetings, both village chiefs and commune chiefs similarly agreed that the level of participation has been significantly changed before and after mine clearance. In Trapeang Tav commune, for example, the commune chief stated that before the clearance of landmines and UXOs, people often requested agricultural tools for farming when attending the meetings. After demining, the requests shifted to focus more on long-term investments and infrastructure, such as roads, bridges, ponds or schools. This is also true in Thlat commune, where the CIP for 2017 focused on reparation of roads and construction of public latrines as high priorities. Villagers were also willing to submit their requests to build community ponds and pumps to NGOs and other groups, such as the Cambodian Red Cross.

According to household interviews and FGDs, awareness of the importance of attending village meetings and the scale of development opportunities stemming from the Commune Investment Plan (CIP) has significantly increased after the demining activities. For example, in Trapeang Tav, villagers perceived that the construction of a small road with the use of the commune/sangkat funds in their village after demining could not happen without their participation and request. They also claimed that they had submitted a request to the CIP and were waiting for a community pond and spillway in 2017.

Aside from CIP meetings at the commune level, public forums were organized by the provinces and districts focusing on the concerns of people regarding health, livelihoods, road conditions, environment, hygiene, and drug use. In such forums villagers also brought up land disputes and conflicts. However, villagers reported that the way such forums were organized seemed to vary by commune. In some communes (e.g. Trapeang Prei) villagers reported that only group representatives were invited to join the forum. On the other hand, in Thlat commune local authorities invited everyone to attend the meetings. Clearly, compared to CIP, such forum were not as effective as their purpose was to collect information rather than directly

addressing people's concerns.

Despite the existence of these platforms, villagers claimed that such forums were not responsive and effective enough to support the victims of land disputes and other concerns. There is a need for having more direct support from NGOs to help raise awareness about land/property rights, land use planning and laws. The study team found that no NGOs in the villages studied worked on land rights issues after demining.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusion

The study concluded that landmine clearance by the HALO Trust have made significant contributions to livelihoods, food and nutrition security of households in 4 target villages. Several evidences from the fields clearly suggest that landmine clearance by HALO Trust became very critical for households as it helped make more lands available for agricultural production expansion; and pave the way for safer access to roads, public spaces, and common properties. The agriculture expansion and diversification through the release of cleared lands and technical supports from KBA resulted in foods available and accessible for many farmers in the villages. Safer access to public assets led to many improvements in infrastructures such as roads, community buildings/halls, schools for children, public ponds and wells. These in turn contribute strongly to social improvements such as clean water, sanitation and hygiene for the rural households as well as education for children through investments in ponds, wells, and roads. In addition, better income for people generated by improved and safe access to markets and additional income activities such as collection of NTFPs (bamboo, mushroom, firewood, etc.), on-farm and off-farm employments enabled farmers to be able to manage their livelihoods, and improve food consumption and dietary for their families. For example, in some cases people could increase the amount of bamboo/shoots, firewood, or mushrooms between three to five times compared with before landmine clearance. Also, easier and safer access to multiple markets helped farmers to negotiate better prices for their produce.

Technical knowledge and skills for production, and market availability and information supported by KBA are among the key factors that make land more productive. The beneficiaries of KBA have responded well to technical trainings about improved agricultural practices. The application of agriculture technical supports enabled farmers to use the lands including those plots released by HALO Trust more productively. Forming different groups including farming/marketing group and saving group helped households collaborate and facilitate their crops and market their products quite effectively. Saving groups helped farmers access to loan, though usually small, which is highly important in providing farmers with flexibility for investing in agriculture production and coping with urgent household expenditures. Moreover, health and nutrition related trainings improved farmers understanding about the issues and significantly contributing to the decision of households in their food consumptions, utilizations and dietary.

Combined efforts by HALO Trust and KBA produced greater impacts on livelihoods, food and nutrition security. The comparative analysis between the villages with HALO Trust only and those villages with both HALO Trust and KBA showed that two organizations complemented each other well in impacting livelihoods, food and nutrition security, in two ways. First, the demining activities and the land released by HALO Trust expanded agricultural production areas leading to more food and incomes for farmers. In addition, when complemented with technical trainings on agriculture production by KBA, agriculture works become more productive, creating strong and sustainable conditions for food and income generation, and thus encouraging farmers to continue their activities. This suggests that both HALO Trust and KBA greatly boosted food availability, accessibility and income for the rural households which create strong basis for sustained access to and availability of foods; while KBA's training on health and nutrition related issues enhanced understanding for the people thereby encouraging food utilization and improve dietary among rural households.

The actual number of people participating in all levels of the development planning process remains limited, but the interest and needs are getting stronger. While the processes for soliciting consensus on the needs and priorities of local development regularly involved the responsible authorities, the people's participation remains somewhat the same due to the lack of trust and limited interaction between local communities and responsible authorities. However, the level of interest and demand toward their needs became stronger, which suggests the fact that awareness about people's rights to social services has improved. People interviewed expressed their willing to use the village and commune planning process as a platform for raising and addressing their needs and concerns.

4.2 Recommendations

Based on the findings and conclusions, the study team would like to make the following recommendations.

1. **The HALO Trust and KBA have proven to be an effective means to produce significant impacts on livelihoods, nutrition and food security.** The HALO Trust and KBA are strongly encouraged to maximize impacts through continued efforts in building their synergies. This could be achieved through regular consultation with each other and share information when it comes to selecting areas for clearance or releasing lands for farmers. This could be done in close coordination with all key stakeholders including community leaders, village and commune chiefs to ensure effective leasing and productive use of lands. Technical support for agricultural production and other training supports in the form of self-help groups, promotion of health and nutrition by KBA should continue. A clear implementation plan in terms of how the land will be used, and commitment from parties involved should also be formulated alongside with proper monitoring plans.
2. **Training provided by KBA for agricultural activities should continue.** These activities have improved productivity, generated more income and made food available for rural households. KBA should continue providing technical supports on farming techniques (i.e. proper use of seeds, land preparation, proper fertilization, pest control, post-harvest management, and climate change adaptation). Also some specific aspects of the extension activities such as crop-rotation, multi-cropping, and use of basic technologies are strongly recommended for the production for rice, cassava, vegetables and other crops. Further support should be extended to strengthening farmer's cooperatives, and coordinated linkages between the farm, market, and private sector.
3. **Continued efforts are needed to improve food and nutrition security at households in the target villages.** Technical supports for home garden activities should be further promoted by KBA as this activity proven to be of great contribution to food consumption and dietary diversity for the poor households. Programs that include cooking demonstration, and training related to nutrition and hygiene/sanitation, should be continued for young mothers and home-care givers.
4. **People engagement in the village and commune development planning has been limited thus continued supports are needed.** While people participation remain same, people expressed strong interest and willingness to use the village and commune planning process as a means to contribute to the development of their communities and to address the issues they are facing. It is

recommended that KBA conduct further consultation with households to identify the main factors that prevent them from active engagement and discuss and agree on ways to foster active participation. Other supports, such as education about human rights, and social services (access to public services, education, and local development planning processes), are also strongly recommended.

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