A GEOSPATIAL ASSESMENT ON SOCIAL IMPACT OF LAND MINES IN SRI LANKA

By

THUSHARA JANAKA JAYAWARDENA

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5998MD2012009

MSC/GR/2012009

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DECLARATION OF THE CANDIDATE

I do hereby declare that he work described in this thesis was carried out by me under the supervision of Dr. (Ven.) Pinnawala Sangasumana Thero and Mr. Pabhath Malavige and a report on this has not been submitted in whole or in part to any university or any other institution for another Degree/Diploma.

Date: 19/06/2014

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T. J. Jayawardena

MSC/GR/2012009

DECLARATION OF THE SUPERVISORS

We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University for the purpose of evaluation.

Certified by:

Supervisors:

15/6/2014

.....

Dr. (Rev) Pinanawala Sangasumana
Head/Senior Lecturer
Department of Geography
University of Sri Jayewardenepura
Nugegoda
Sri Lanka.

.....

Mr. Prabhath Malavige
Head / GIS/ Premises Section,
Sri Lanka Ports Authority
Colombo
Sri Lanka.

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Thushara Janaka Jayawardena

ABSTRACT

As Sri Lanka emerges from almost two decades of armed conflict it finds that Landmines, Unexploded Ordnance (UXO) and Improvised Explosive Devices (IED) constitute a significant impediment to the reconstruction and resettlement envisaged by national and local authorities, and to the aspirations for a normal and productive life held by its citizens. The conflicts displaced approximately 800,000 from the North and East and thereare approximately 120,000 refugees in camps in India. Whilst the entire country has suffered from the consequences of the conflict, the Districts of Jaffna, Killinochchi, Mannar, Mullaitivu, Vavuniya, Batticaloa, Trincomalee, Ampara,with some areas in Anuradhapura and Polonnaruwa have borne the brunt of the conflict.

Livelihood particularly for the poor, have been destroyed because of this manmade disaster. Much of the physical infrastructure and access to the means of food production also have been destroyed or blocked or have simply deteriorated over time; their replacement or rehabilitation is essential for economic life to resume, and normal living hoods to be re-established. The presence of Landmines complicates efforts to address these problems by local residents, by local national authorities and by international organizations, land mine casualties had been as high as 15 – 20 per month in early 2000 in the affected areas which, proportionate to the population, is very high. In recent years and months they have declined, most likely as a result of the combined Humanitarian Landmine Clearance operations. The latest survey statistics show that more than 650 villages are known to be affected by Landmines.

Both the Sri Lankan government forces and the LTTE used Landmines extensively, largely during the 1990s and both maintain stockpiles of weapons. Although neither side has

signed the Anti Personnel Landmine Ban Treaty or the Geneva Call Deed of Commitment, the Government of Sri Lanka has said that it is not a matter of whether or not the country would sign the Treaty, but whenwould this take place is a matter with the prevailing situation.

As mentioned in the beginning the most significant threat is from the Landmines used by both parties with the ongoing Internally Displaced People and Refugee resettlement programmes, the proper mapping of the affected areas has arisen as a notational priority in the North and East. Because this type of proper mapping will be a guide to the Government, Humanitarian Landmine clearance Organizations, International Non Government Organizations, Non Government Organizations and, Aid Workers, Donors and even sometimes for the Security Forces

On 21st September 2004, Sri Lanka became a party to the Amended Protocol II of the Treatyon Certain Conventional Weapons (CCW) that stringently regulates the use of anti personal landmines.

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LIST OF ABBREVIATIONS

AP Landmine	Antipersonnel Landmine
AT Landmine	Anti Tank Landmine
DDG	Danish Demining Group
DS	Divisional Secretary
DSD	Divisional Secretariat Division
DSS	Decision Support System
FOS	Free and Open Source
GIS	Geographic Information Systems
GN	Grama Niladhari
GND	Grama Niladhari Division
GOSL	Government of Sri Lanka
GPS	Global Positioning Systems
HDU/MAG	Humanitarian Demining Unit / Mines Advisory Group
HDU/NPA	Humanitarian Demining Unit / Norwegian Peoples Aid
IMAS	International Mine Action Standards
IMSMA	Information Management System for Mine Action
INGO	International Non Government Organization
JCCP	Japanese Centre for Conflict Prevention
Km^2	Square Kilometers
LIS	Landmine Impact Survey
LTTE	Liberation Tigers of Tamil Eelam
M^2	Square Meters
MAG	Mines Advisory Group
MAG/TRO	Mines Advisory Group/Tamil Rehabilitation Organization
MMIPE	Milinda Moragoda Institute for Peoples Empowerment
MOU	Memorandum of Understanding
NGO	Non Government Organization
RONCO	United states demining organization
RS	Remote Sensing
SL Army	Sri Lanka Army
TNT	Trinitrotoluene
UNDP	United Nations Development Programme
UNICEF	United Nations Children and Education Fund
UNMAS	United Nations Mine Action Services

CHAPTER ONE

INTRODUCTION

1.1 Background

The AP mine has traditionally been part of the armoryof almost every army in the world. The types of warfare in which mines have been used or were intended to be used cover a wide spectrum, from the Cold War confrontation between NATO and the Warsaw Pact in Central Europe, through smaller-scale international conflicts such as the India-Pakistan war and the Iran-Iraq and Gulf wars, to intra state conflicts such as those in Angola, Cambodia and Nicaragua. At the bottom end of the scale, mines have also been used by armies, police forces, insurgent groups and warlords for purposes of population control and terrorism. Recovered mines have even been used by individual civilians to protect their own property. Each type of warfare has found new uses for the AP mine. The main characteristic of a mine is that it is designed to be victim-actuated, which means it will detonate or explode through the ''presence, proximity or contact'' of its victim (a person or a vehicle) with it or its fusing mechanism. The fuse may incorporate a tripwire, an anti-handling device or some form of electronic sensor. This is the main distinction between a mine and a classicalammunition. Some ammunitions are fused to act as mines, and detonate if touched or moved, but most are fused to explode on impact, usually with a hard target, and are generally less dangerous than mines if they fail to explode. Most ammunitions remain on the surface, unless they have enough momentum to penetrate the ground. Ammunitions can still be lethal if mishandled, and the unfortunate victims of many ammunition accidents are children, who cannot resist playing with them.

It is now becoming generally accepted that the world's mine contamination problem is reaching crisis point. It has been estimated the number of un-cleared landmines around the world to be about 84 million in 70- countries. The United Nations projects that if the use of mines were to be stopped immediately it would take 1,100 years and 33 billion dollars to clear, at current rates, those already in place. The list of mine-infested States reads like the history of recent conflicts: Angola, Afghanistan, Bosnia-Herzegovina, Cambodia, Croatia, Ethiopia, Iraq, Mozambique, Rwanda, Somalia, Sudan, Yugoslavia

and Sri Lanka. Each year 2-5 million new mines are put in the ground, adding to ''one of the most widespread, lethal and long-lasting forms of pollution'' the world has ever known. Landmines differ from most weapons, which have to be aimed and fired. Once they have been laid, mines are completely indiscriminate in their action. Unless cleared, they continue to have the potential to kill and maim even long after the warring parties they targeted have ceased fighting. The United Nations has reckoned that landmines are at least ten times more likely to kill or injure a civilian after a conflict than a combatant during hostilities. They are also long-lasting. No estimate has been given for the ''life'' of a mine; however, mines laid in Libya and Europe during World War II are still active and causing casualties even after 50 years. Modern plastic-cased mines, which are stable and waterproof, are likely to remain a hazard for many decades. (Wenkoff, 2008)

Sri Lanka is a tropical island lying close to the southeast tip of the Indian subcontinent. Sri Lanka is situated between 6°– 10° North latitude and between nearly 80°– 82° E longitude and over a surface area of 65,600 km^2. 20.1 million people live in Sri Lanka. The country administrative structure consists of 25 districts. Out of those 25 districts 10 districts namely Ampara, Anuradhapura, Batticaloa, Jaffna, Kilinochchi, Mannar, Mullaitivu, Polonnaruwa, Trincomalee and Vavuniya are affected by landmines as a result of a three decades old conflict between government forces and Liberation Tigers of Tamil Eelam (LTTE). These districts cover 3 main provinces North, East and North Central. The total land covered by these districts is around 29229 Km^2, around 44.5% of the total surface area.

As a researcher discussed earlier about land mine contamination in world context, landmine contamination in north and east parts of Sri Lanka happen to be a very serious problem, causing casualties and creating obstacles to the socio-economic development of those areas. During the three decade aged civil conflict, Sri Lanka has experienced varied kinds of explosives including land mines of Anti Personal, Anti Tank, Unexploded Ordnances (UXO), etc. The conflict has resulted in instability in the country's socio culture, economic, environment and political bodies of the country. It will continue to be present in most of the areas for a time-scale of the order of five years, assuming that present rates of area reduction and landmine clearance can be sustained, and this is not certain as it depends mainly on donor funding which is not