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Costs of Disarmament

Cost Benefit Analysis of SALW Destruction versus Storage

Mandy Turner

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FOREWORD

I am delighted that UNIDIR, in partnership with SEESAC and the University of Bradford, is publishing *Cost Benefit Analysis of SALW Destruction Versus Storage*, a practical tool to help governments, international and regional organizations make cost-effective and realistic decisions about surplus small arms and light weapons stocks.

This project was undertaken in the context of UNIDIR's Costs of Disarmament research programme, which aims to achieve a better understanding of the costs and benefits of disarmament with a view to assisting policy makers decide how money is spent on such commitments. It follows a three-volume series by Susan Willett, published between 2002 and 2004, which addressed the methodological aspects of cost benefit analysis with regard to disarmament and arms control, as well as an examination of the costs associated with nuclear armament and the South Asian arms dynamic.

The high costs of safe and secure storage and transportation of surplus small arms and light weapons and their ammunition is often overlooked when governments decide to retain stocks for future sale. The markets and potential for sale vary over time and all too often such stocks—rather than fulfilling their promise of being financial assets—can become a serious economic and social burden. This book aims to provide a tool for decision makers to ascertain and compare the likely cost of storage and the costs of destruction.

This publication was made possible through the generous support of SEESAC.

Patricia Lewis
Director
UNIDIR

ACKNOWLEDGEMENTS

This report was written by Mandy Turner. The model was developed by Malcolm Chalmers, Mandy Turner and David Mutimer. The author would like to thank Amna Berbic, Andy Brunt, Owen Greene, Patricia Lewis and Adrian Wilkinson for their comments and assistance, as well as those who agreed to be interviewed for the project.

ABOUT THE AUTHOR

Dr Mandy Turner is a research fellow at the Centre for International Cooperation and Security, based in the Department of Peace Studies, University of Bradford. Her main research interests lie in development and security, particularly how insecurity impacts on the poor, and how development has become "securitized". She has conducted research and consultancy work for the UK's Department for International Development and UNIDIR on the societal impacts of armed violence and on the impact of conflict reduction projects.

EXECUTIVE SUMMARY

The Centre for International Cooperation and Security (CICS), based in the Peace Studies Department at Bradford University, was commissioned by the United Nations Institute for Disarmament Research (UNIDIR) and the South Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC) to develop a cost benefit analysis model of storage versus destruction of small arms and light weapons (SALW).

The majority of states within South-eastern Europe (SEE) consider that the sale of surplus stocks will generate income, which can then be used to support the restructuring of their armed forces. While this would initially appear to make good business sense, the reality is that the global market is now saturated with the weapon types found in SEE national inventories. There is a massive surplus of small arms and light weapons and associated ammunition across the region. Given this market saturation and the law of supply and demand, it is likely that any potential income will be minimal in the short to medium term.

The Cost Benefit Analysis Model was therefore developed in order to allow SEE states to estimate the real costs involved in the storage of ammunition and weapons that would be necessary prior to any sale. It allows each storage depot to calculate its full running costs and how much time it would take to break even in terms of the alternative costs of destruction. It also allows a comparison of the potential benefits from sale versus the costs of storage. Many of the current financial accounting systems of the region are not sophisticated enough to identify the true costs of storage and of destruction. This model will help South-eastern European states to do this. The model is in the form of an Excel spreadsheet, which comes on the accompanying CD-ROM.

The model was developed with assistance from SEESAC and the United Kingdom Ministry of Defence. It was tested in Bosnia and Herzegovina (BiH). It was felt that this study was timely, as BiH is currently undergoing major demilitarization and armed forces restructuring, and particularly because BiH is one of the states in the region that has expressed

a desire to sell its surplus weapons and ammunition rather than destroy them. The initial investment costs of bringing BiH storage depots up to North Atlantic Treaty Organisation (NATO) standards are high. In addition, the level of investment required each year to maintain these standards is high. The annual cost of maintaining the UK Ministry of Defence Central Ammunition Depot in Kineton, Warwickshire, is £9 million, although a significant proportion of this is staff costs at Western European salary levels.[1] BiH has a huge surplus of weapons and ammunition, and as such would have to make a substantial investment in many sites in order to ensure the safe and secure storage of the weapons awaiting potential sale. This Cost Benefit Analysis Model will allow the BiH Ministry of Defence (and indeed other states in the region) to make informed decisions on whether this is the best financial option for them.

While this model was originally commissioned to help states in South-eastern Europe make decisions about the future of their surplus stocks, the model is applicable to all other regions. It is hoped that it will be a useful tool for all ministries of defence wishing to compare the costs of storage versus those of destruction, and the potential benefits from sale versus the costs of storage.

Note

1 This is for the ammunition depot only. This excludes the running costs of the Army School of Ammunition, also based at Kineton, and which, if included, would take the figures up to €16.1 million €17.6 million (£11–12 million) per annum.

INTRODUCTION

The Centre for International Cooperation and Security (CICS), based in the Peace Studies Department at Bradford University, was commissioned by the United Nations Institute for Disarmament Research (UNIDIR) and the South Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons (SEESAC) to develop a cost benefit analysis model for use in the storage of small arms and light weapons (SALW) and ammunition using South-eastern Europe (SEE) as a case study.

SEESAC has a mandate to provide assistance and support to partner nations within SEE on the destruction of SALW. Under its mandate SEESAC is responsible for identifying gaps in knowledge and for assisting in the design—and implementation support where necessary—of projects to meet the needs for the destruction of SALW in the region. This study complements a wider UNIDIR project examining the costs of disarmament.[1]

BACKGROUND TO THE STUDY

The majority of nations within SEE consider that the sale of surplus stocks of weapons and ammunition will generate income that can be used to support the restructuring of their armed forces. However, the real picture is much more complicated. Virtually every country within South-eastern Europe has been attempting to sell surplus SALW over the past few years, with very limited success. The only legitimate and transparent sale of military weapons over the past two years, of which we are aware, has been the supply by Romania of 1,000 AK47 assault rifles to the new Afghan Army.[2] Although recent evidence in late 2005 and early 2006 also suggests that very large stocks of weapons from Albania, Bosnia and Herzegovina, Romania, and Serbia and Montenegro have been covertly acquired through third parties to equip the new and developing security forces of Afghanistan and Iraq.

The reality is that the massive surplus across the region, and in Central and Eastern Europe, means that the global market is now saturated with the weapon types in the South-eastern European national inventories. This market saturation, when combined with the laws of supply and demand, suggests that any potential income is likely to be minimal, and will not

produce a return on the investment of effort required. It is likely that potential customers would also purchase ammunition to support the weapons. However, the lack of surveillance systems to assess the physical and chemical condition of many of the national ammunition stockpiles means that its performance (and safety) cannot be guaranteed. This makes the ammunition a very unattractive proposition to reputable and legitimate end-users.

If reputable and legitimate end-users are scarce in the market, one frequently employed option is to sell on a "few-questions-asked" basis, with questionable end-user certificates. Virtually all illicit weapons are obtained through this "ask-no-questions, get-told-no-lies" process. Hence, any decision to sell to the grey market in this way stands a high probability of creating a source of supply for the illicit (black) market. The uncontrolled proliferation and illicit trafficking of SALW is a serious problem around the world—it has fuelled crime and insecurity, exacerbated conflict and is undermining post-conflict peace-building. Problems related to SALW proliferation are also likely to continue to pose a serious constraint to regional economic and social development.

The destruction of surplus SALW and ammunition would, therefore, significantly reduce the likelihood of future illegal proliferation. In addition, it would demonstrate the political will of governments, supported by the international community, to address the problems of SALW control within their region. The destruction of large surpluses of weapons would also provide a political lead to the rest of the world. From 2000 to 2004, due to lack of sales opportunities, surplus weapon destruction took place in Albania (128,500 weapons), Bosnia and Herzegovina (20,000), Bulgaria (102,000), Romania (195,500), and Serbia and Montenegro (116,000).[3]

In SEE, states are party to a number of regional and international agreements related to SALW. These include the Organization for Security and Co-operation in Europe's (OSCE) Document on Small Arms and Light Weapons (2000) and the Stability Pact's Regional Implementation Plan on SALW (2001). Some states have also signed up to the UN Firearms Protocol and voluntarily aligned themselves with the European Union (EU) Code of Conduct on Arms Exports (1998). Any future accession to the EU by SEE states would mean full compliance with its Code of Conduct. The chances of SEE states thereafter finding a country that 1) wishes to purchase their stockpile of "dated" weapons and 2) is an acceptable end-user under the

EU Code of Conduct are very slim. In addition, there is a real danger to the public of inappropriately stored and managed stockpiles of ammunition and explosives.

The real costs of security and storage of SALW and ammunition, whilst awaiting a potential sale, could eventually cost more than any possible income from sales. However, the financial accounting systems of some of the ministries of defence in the SEE region are not yet sophisticated enough to identify the true costs of storage and security. The goal of this project, therefore, was to develop a model that would assist governments to identify the real costs of storage and security for weapons and ammunition. They would then be able to make informed decisions about whether the most cost-effective option is storage while trying to sell the stocks, or destruction. The Cost Benefit Analysis Model will thus help identify the real costs of storage and security to a national ministry of defence (or, indeed, ministry of the interior).

The security fence of the Kiseljak Ammunition Depot. Officers in charge said they needed more wire, as well as concrete and earth-moving equipment in order to finish the job as the security was not, in their view, adequate. Witness the proximity of the nearby village.

METHODOLOGY

The Cost Benefit Analysis Model is set out as an Excel spreadsheet designed to determine the real costs of storage and security of both weapons and ammunition. It was developed by a defence economist, Malcolm Chalmers, and a researcher, Mandy Turner, and allows for a comparison between storage and security costs over various periods versus the generic costs of destruction, or potential income from sales of weapons, ammunition or storage sites.

The Cost Benefit Analysis Model was developed in consultation with SEESAC and after a visit to the UK's Ministry of Defence Central Ammunition Depot in Kineton, Warwickshire (described below). Subsequently the CICS team broke down the different cost elements in storing weapons and ammunition according to NATO best practices. In addition, the team surveyed work conducted by SEESAC and the OSCE on the storage of SALW and ammunition.

DEVELOPING THE MODEL

The CICS team visited the UK Ministry of Defence Central Ammunition depot in Kineton, Warwickshire, on 4 July 2005. Interviews were conducted with the Commanding Officer and the Financial Manager.

Kineton is a 2,700 acre (5.5 km by 3.5 km) site, which, in addition to storing ammunition, is also used as a facility for training Ammunition Technical Officers (ATOs). ATOs are specially trained; there is no civilian equivalent. Limited additional income is generated by Kineton to reduce storage costs by renting areas out for civilian commercial and agricultural purposes.

The annual cash costs (direct costs) for the ammunition depot at Kineton are €13.175 million (£9 million).[4] Staff costs make up 65% of this, of which the most expensive are military personnel. The depot currently has 83 military personnel (excluding guards, which consist of around 60 Ministry of Defence Police, Ministry of Defence Guard Service and Military Provost Guard Service [armed] personnel), and 115 civilians (who carry out support work such as finance and human resources).

There is a substantial difference in cost depending on whether the facility is storing ammunition for disposal or for use. Once ammunition for disposal is stored there is not much need for further work apart from checking stock. If ammunition is being stored for use/resale stocks have to be stored to a higher standard and go through checks to ensure they are safe to use. Certain types of ammunition require temperature-controlled packaging. Ammunition can become unusable or even dangerous from being flown to and from missions (particularly cluster bombs and rockets).

The cycle of maintenance is also different depending on whether stocks are being stored for destruction or stored for use/resale. There is a 360-day stock-take cycle at Kineton. There are 8–10 Ammunition Technicians dedicated to this task alone. Information technology systems are used to control the storage and these help to find errors or account for any missing stock. Each batch is stamped to ensure quality and type of storage/use (e.g. temperature).

Other running costs include: 1) property management: maintenance and repair of buildings, roads, grounds, railway, staff quarters; 2) catering and cleaning; 3) vehicle equipment supply and maintenance; 4) safety staff, such as firefighters, and emergency health staff, such as doctors; 5) telephones and information technology; and 6) security—it would cost £3 million alone to replace the alarm systems.

In addition, Kineton has NATO-standard storage units, which consist of concrete buildings with thick walls designed to keep the temperature constant and to collapse in a particular way in order to stifle fire. The cost of construction of each storage building designed to these specifications was estimated at £250,000.

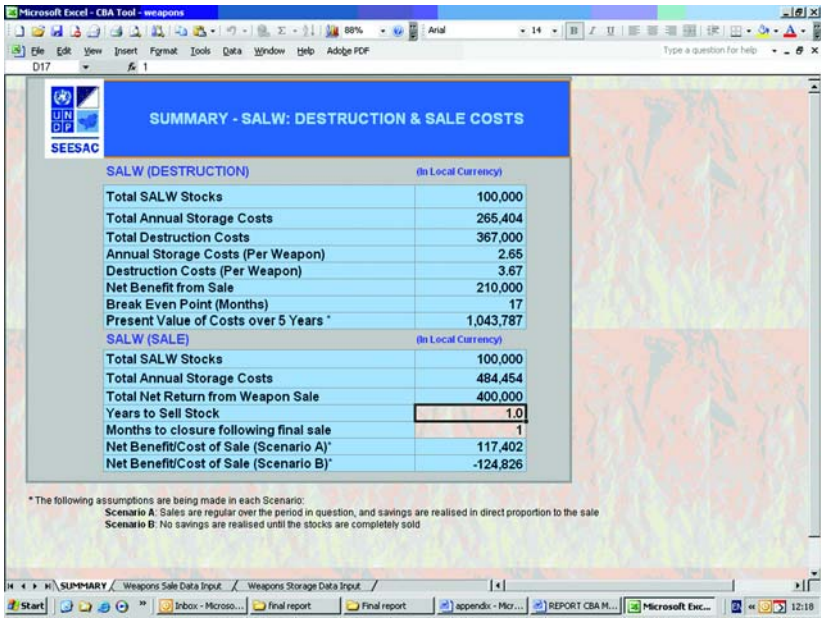
The Cost Benefit Analysis Model is based on the identification and breakdown of costs of this NATO-standard depot.

THE COST BENEFIT ANALYSIS MODEL

The sections that follow show examples from the different pages users can expect to see on the two Cost Benefit Analysis Models (one for SALW, the other for ammunition), which are found on the accompanying CD-ROM. The images from the model and the explanations provided below on how to use it are for the weapons model. However, the model for ammunition is the same and so the explanations that follow apply in this case also.

On the model there are three pages, the first is a Summary page, the second is a Weapons Sale Data Input page, and the third is a Weapons Storage Data Input page. The pages are accessed by clicking on the name tabs at the bottom of the Summary screen. On each page, it is only possible to enter data into the cream-coloured boxes. The blue boxes (which are locked and cannot be accessed) calculate the results based on the data entered in the cream boxes.

SUMMARY PAGE

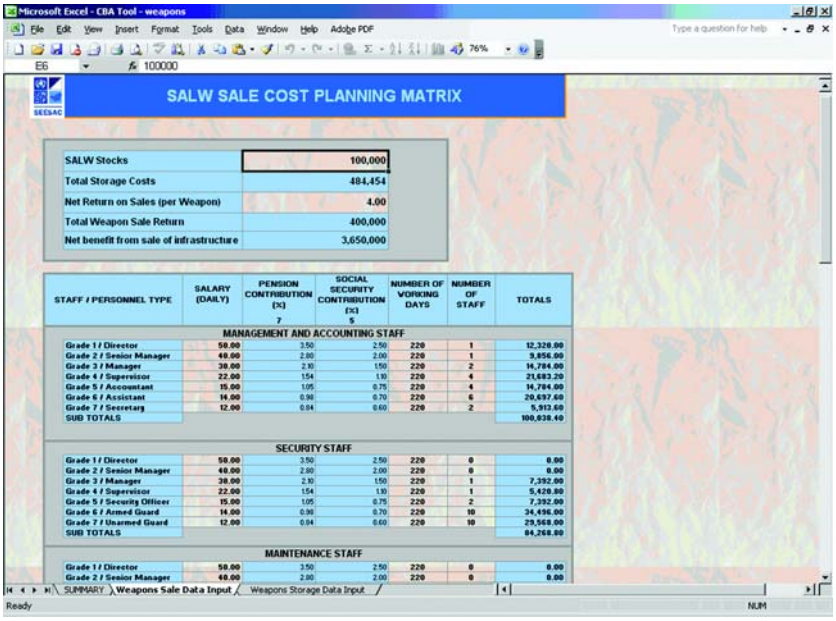


This is the Summary page. The first set of figures, "SALW (Destruction)", will provide a ministry of defence with the total annual storage cost of a depot for weapons (or ammunition) and compare it with the cost of destruction. The "Net Benefit from Sale" box calculates what could be gained from closing a depot in terms of the sale of equipment, buildings and land. The "Break Even Point" is the point at which the financial cost of destroying the weapons or ammunition breaks even with the cost of storing them. This will allow SEE states to assess whether it would be more cost effective to destroy the weapons rather than storing them in the hope of a future potential sale. The boxes in this section are "locked" as these figures are calculated and brought forward from the data input pages that follow.

The second set of figures, "SALW (Sale)" will allow the user to compare returns from sales of weapons with the cost of storage. The two boxes allowing data entry are the boxes "Years to Sell Stock" and "Months to closure following final sale". On the basis of these pieces of information, together with the storage cost estimate, the model calculates the net benefit, based on two sets of assumptions:

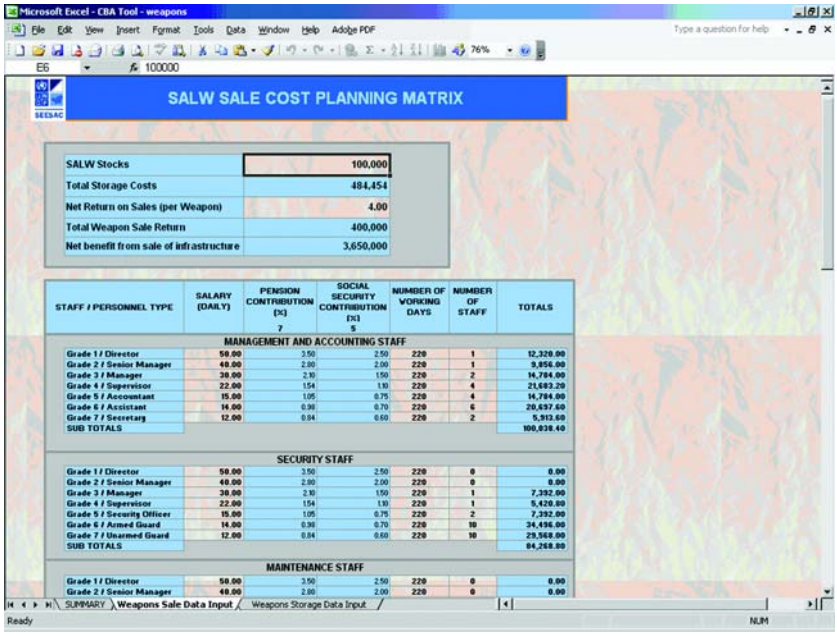
- **Scenario A**: assumes that the stocks are sold regularly over the period in question, and that the costs drop in proportion as the stocks are sold.
- **Scenario B**: assumes that the full storage costs must be maintained until the stocks are completely sold.[5]

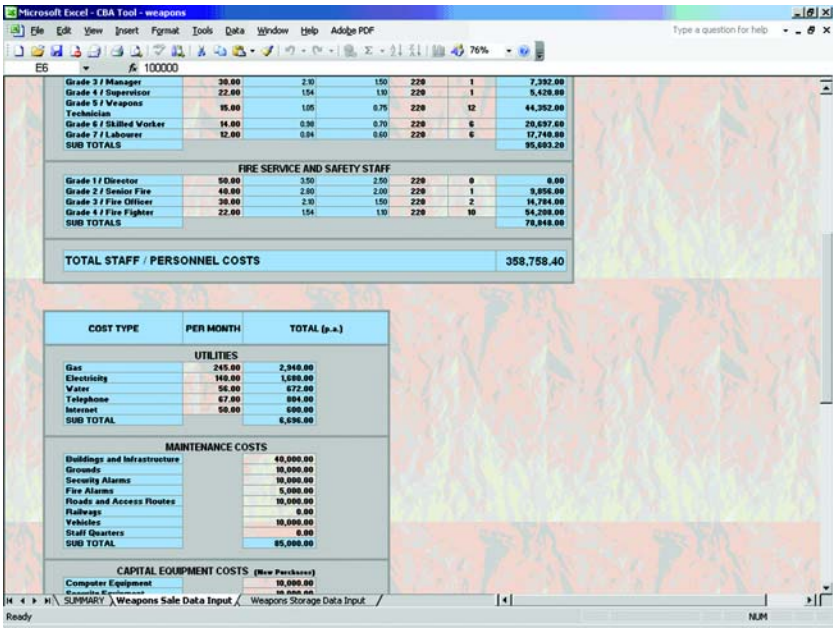
Weapons Sale Data Input

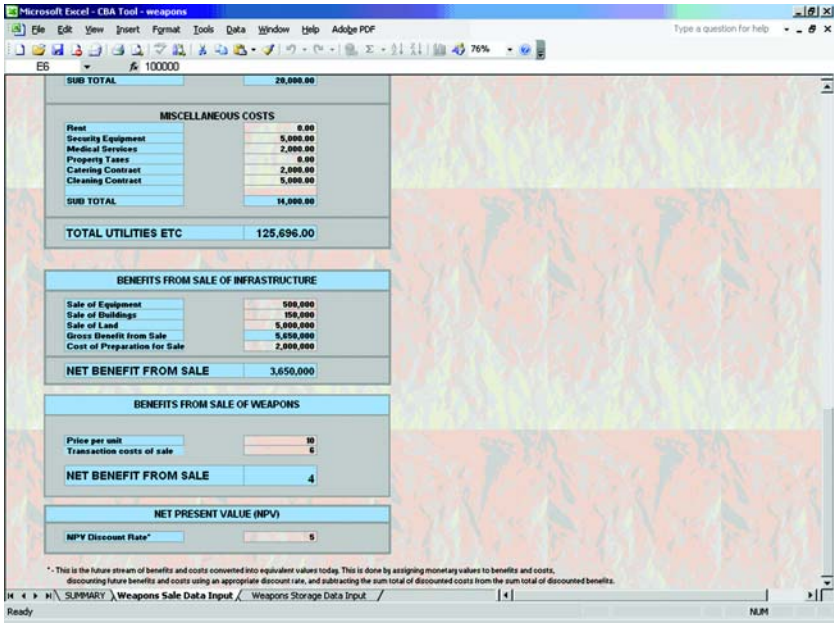


The image shown above is taken from the Weapons Sale Data Input page, which allows a comparison of return from sales of weapons with cost of storage. In the first table, the data to be entered are total SALW stocks and net return on sales (per weapon). The other tables cover the different personnel types that could be used in a storage depot. This includes management and accounting, security, maintenance and fire safety. The data to be entered include the salary and number of working days and how many are employed at that grade. The model then calculates the annual cost.

The following pages show the rest of the tables that appear on the Weapons Sale Data Input page, which cover the other costs involved in running a storage depot. These include: utilities (e.g. gas and electricity), maintenance (e.g. buildings and infrastructure), capital equipment (e.g. protective clothing and computer equipment), and other miscellaneous costs (e.g. rent paid on the land used for the depot and catering contracts).


Microsoft Excel - CBA Tool - weapons
SALW SALE COST PLANNING MATRIX
SALW Stocks 100,000
Total Storage Costs 484,454
Net Return on Sales (per Weapon) 4.00
Total Weapon Sale Return 400,000
Net benefit from sale of infrastructure 3,650,000
STAFF / PERSONNEL TYPE
SALARY (DAILY)
PENSION CONTRIBUTION (%) 7
SOCIAL SECURITY CONTRIBUTION (%) 5
NUMBER OF WORKING DAYS
NUMBER OF STAFF
TOTALS
MANAGEMENT AND ACCOUNTING STAFF
Grade 1 / Director 50.00 3.50 2.50 220 1 12,320.00
Grade 2 / Senior Manager 40.00 2.80 2.00 220 1 9,856.00
Grade 3 / Manager 30.00 2.10 1.50 220 2 14,784.00
Grade 4 / Supervisor 22.00 1.54 1.10 220 4 21,693.20
Grade 5 / Accountant 15.00 1.05 0.75 220 4 14,784.00
Grade 6 / Assistant 14.00 0.98 0.70 220 6 20,697.60
Grade 7 / Secretary 12.00 0.84 0.60 220 2 5,913.60
SUB TOTALS 100,038.40
SECURITY STAFF
Grade 1 / Director 50.00 3.50 2.50 220 0 0.00
Grade 2 / Senior Manager 40.00 2.80 2.00 220 0 0.00
Grade 3 / Manager 30.00 2.10 1.50 220 1 7,392.00
Grade 4 / Supervisor 22.00 1.54 1.10 220 1 5,420.80
Grade 5 / Security Officer 15.00 1.05 0.75 220 2 7,392.00
Grade 6 / Armed Guard 14.00 0.98 0.70 220 10 34,496.00
Grade 7 / Unarmed Guard 12.00 0.84 0.60 220 10 29,568.00
SUB TOTALS 84,268.80
MAINTENANCE STAFF
Grade 1 / Director 50.00 3.50 2.50 220 0 0.00
Grade 2 / Senior Manager 40.00 2.80 2.00 220 0 0.00
SUMMARY Weapons Sale Data Input Weapons Storage Data Input
Ready
NUM

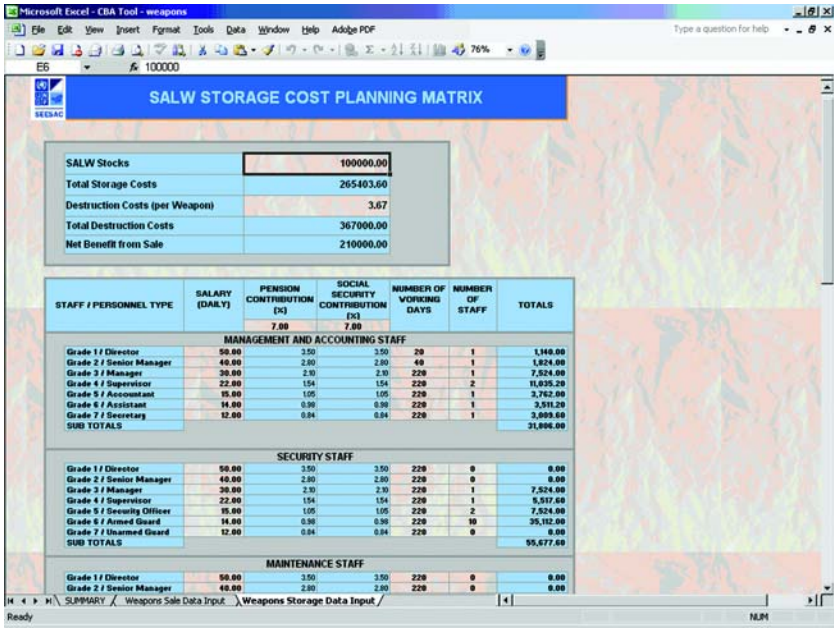

Microsoft Excel - CBA Tool - weapons
Grade 3 / Manager 30.00 2.10 1.50 220 1 7,392.00
Grade 4 / Supervisor 22.00 1.54 1.10 220 1 5,420.80
Grade 5 / Weapons Technician 15.00 1.05 0.75 220 12 44,352.00
Grade 6 / Skilled Worker 14.00 0.98 0.70 220 6 20,697.60
Grade 7 / Labourer 12.00 0.84 0.60 220 6 17,740.80
SUB TOTALS 95,603.20
FIRE SERVICE AND SAFETY STAFF
Grade 1 / Director 50.00 3.50 2.50 220 0 0.00
Grade 2 / Senior Fire 40.00 2.80 2.00 220 1 9,856.00
Grade 3 / Fire Officer 30.00 2.10 1.50 220 2 14,784.00
Grade 4 / Fire Fighter 22.00 1.54 1.10 220 10 54,208.00
SUB TOTALS 78,848.00
TOTAL STAFF / PERSONNEL COSTS 358,758.40
COST TYPE
PER MONTH
TOTAL (p.a.)
UTILITIES
Gas 245.00 2,940.00
Electricity 140.00 1,680.00
Water 56.00 672.00
Telephone 67.00 804.00
Internet 50.00 600.00
SUB TOTAL 6,696.00
MAINTENANCE COSTS
Buildings and Infrastructure 40,000.00
Grounds 10,000.00
Security Alarms 10,000.00
Fire Alarms 5,000.00
Roads and Access Routes 10,000.00
Railways 0.00
Vehicles 10,000.00
Staff Quarters 0.00
SUB TOTAL 85,000.00
CAPITAL EQUIPMENT COSTS (New Purchases)
Computer Equipment 10,000.00
SUMMARY Weapons Sale Data Input Weapons Storage Data Input
Ready
NUM



The final table, "Benefits from Sale of Infrastructure", allows a calculation of what would be made if the depot were to be closed and sold. This covers money accrued from the sale of buildings, land and equipment. The "Net Present Value" (NPV) is set by national governments, and as such the figure is entered by the user. This is the future stream of benefits and costs converted into equivalent values today.

Weapons Storage Data Input

The following image is taken from the Weapons Storage Data Input page, which allows a comparison of the cost of storage with the cost of destruction. In the first table, the data to be entered are total SALW stocks and destruction costs (per weapon). As on the page Weapons Sale Data Input, the additional tables that follow this first table cover the different costs involved in running a depot and will require some data input by the user.


Microsoft Excel - CBA Tool - weapons
File Edit View Insert Format Tools Data Window Help Adobe PDF
Type a question for help
E6
100000
SEESAC
SALW STORAGE COST PLANNING MATRIX
SALW Stocks 100000.00
Total Storage Costs 265403.60
Destruction Costs (per Weapon) 3.67
Total Destruction Costs 367000.00
Net Benefit from Sale 210000.00
STAFF / PERSONNEL TYPE
SALARY (DAILY)
PENSION CONTRIBUTION (X) 7.00
SOCIAL SECURITY CONTRIBUTION (X) 7.00
NUMBER OF WORKING DAYS
NUMBER OF STAFF
TOTALS
MANAGEMENT AND ACCOUNTING STAFF
Grade 1 / Director 50.00 3.50 3.50 20 1 1,140.00
Grade 2 / Senior Manager 40.00 2.80 2.80 40 1 1,824.00
Grade 3 / Manager 30.00 2.10 2.10 220 1 7,524.00
Grade 4 / Supervisor 22.00 1.54 1.54 220 2 11,035.20
Grade 5 / Accountant 15.00 1.05 1.05 220 1 3,762.00
Grade 6 / Assistant 14.00 0.98 0.98 220 1 3,511.20
Grade 7 / Secretary 12.00 0.84 0.84 220 1 3,009.60
SUB TOTALS 31,806.00
SECURITY STAFF
Grade 1 / Director 50.00 3.50 3.50 220 0 0.00
Grade 2 / Senior Manager 40.00 2.80 2.80 220 0 0.00
Grade 3 / Manager 30.00 2.10 2.10 220 1 7,524.00
Grade 4 / Supervisor 22.00 1.54 1.54 220 1 5,517.60
Grade 5 / Security Officer 15.00 1.05 1.05 220 2 7,524.00
Grade 6 / Armed Guard 14.00 0.98 0.98 220 10 35,112.00
Grade 7 / Unarmed Guard 12.00 0.84 0.84 220 0 0.00
SUB TOTALS 55,677.60
MAINTENANCE STAFF
Grade 1 / Director 50.00 3.50 3.50 220 0 0.00
Grade 2 / Senior Manager 40.00 2.80 2.80 220 0 0.00
SUMMARY Weapons Sale Data Input Weapons Storage Data Input
Ready
NUM

TESTING THE MODEL IN BOSNIA AND HERZEGOVINA

The model was tested in Bosnia and Herzegovina (BiH) on a one-week assessment visit from 28 November until 2 December 2005. The aim of the visit was to establish whether all the costs involved had been covered in the initial spreadsheet, and if it was going to be useful for the government of BiH (and thus other states in the region). Like many countries in the region, BiH is going through intense restructuring due to the transition from state socialism to capitalism. However, given that it is only 10 years since the end of the civil war, and given the particular political arrangements instituted in order to secure peace, BiH is also currently undergoing intense political restructuring to create one state entity. This will take over from the two different Entity states created under the 1995 Dayton Peace Accord[6]—the Federation of Bosnia and Herzegovina and the Republika Srpska. There are a number of United Nations Development Programme (UNDP) projects currently aimed at strengthening national institutional capacities because of the complex systems of governance at state, entity, district and cantonal/ municipal levels.

As in other parts of SEE, in BiH there is also a legacy of bureaucratic and inefficient public administration practices and processes, and unsophisticated accounting systems. The model developed in this project will provide ministries of defence in the region with a sophisticated yet easy-to-use model through which they can identify the true costs of the storage and security of ammunition and weapons.

WEAPON AND AMMUNITION STORAGE IN BIH

A process of demilitarization and the restructuring of the armed forces is currently being undertaken in BiH. The two military forces of the Federation Army (VF) and the Army of the Republika Srpska (VRS) will be merged into one unified BiH force under a single Ministry of Defence, which took over from the Entity Ministries of Defence on 1 January 2006. Although the final decisions have not yet been made, estimates have been made of the potential size of the armed forces, the amount of ammunition and weapons currently in the country, and what is considered surplus (see Table 1).

Table 1. Armed forces, stock levels, surplus and storage sites

Future size of armed forces[a]	Military forces: 9,000–10,000 Reserve forces: 50% of standing army[b]
Current stock levels	Total weapons: 222,338 SALW: 213,960 weapons Total ammunition: 266,714,200 rounds[c]
Estimated surplus	SALW: 150,000 weapons Ammunition: 30,000 tonnes[d]
Current storage sites (SALW and ammunition)	104 (65 VF; 39 VRS)
Future storage sites (SALW and ammunition)	9[e]

[a] The final decision on this will be made in June 2006.
[b] Interview with Amna Berbic of UNDP, 2 December 2005. This information can also be found at <www.globalsecurity.org/military/library/news/2005/08/mil-050818-rferl04.htm>.
[c] NATO/EUFOR DARE database, 30 August 2005. Ammunition updated 6 September 2005; no breakdown of SALW ammunition provided.
[d] Interview with Amna Berbic of UNDP, 2 December 2005.
[e] The decision to have only nine sites was made by the Office of the High Representative.

Stock management and security is under the control of the Armed Forces of BiH (AFBiH) with the European Union Force in Bosnia and Herzegovina (EUFOR) responsible for monitoring the safe storage and transportation of all weapons and ammunition. The database used for this by EUFOR is called DARE. All weapons and ammunition are marked and thus traceable.

Given the current amount of weapons and ammunition in the country, the decision to reduce the number of storage sites to nine is completely unrealistic until the stocks have been reduced to a reasonable level. At present, these stocks will not physically fit into only nine sites, let alone comply with any reasonable explosive safety distances.[7] All the depot commanders at the sites visited expressed concern over the amount of ammunition and weapons being transported around the country in order to consolidate it in fewer sites. One depot commander explained that over the

next few days (beginning of December 2005) he was expecting to receive (in addition to his current stock) another 8,000 to 9,000 weapons, and over the next month (December 2005) a further 60,000 artillery rounds from the Federation Army's arsenal. This, he said, would cause problems, as there was not enough storage space; he stated that the new stock would have to be stored outside.[8]

The government of BiH currently wishes to sell its surplus weapons and ammunition.[9] However, the ongoing work of the Defence Reform Commission in BiH has suggested that the sale of surplus SALW and associated ammunition may not be a practical option for the AFBiH. In addition, SEESAC has reported that the global market is currently saturated with the weapon types that exist in the AFBiH inventory.

There was a moratorium on arms sales in BiH, but this ended on 31 December 2005. There have already been sales or donations to the United States, which has then shipped the arms out to Iraq and Afghanistan.[10]

Dampness in Kiseljak Ammunition Depot building, which currently stores ammunition. Officers in charge pointed out that they needed materials to bring the buildings up to safety standards.

STORAGE DEPOT VISITS

Three storage sites were visited: Visoko, Jahorinski Potok, and Kiseljak. The costs involved in running these depots appeared to be minimal as they are not up to NATO standard—many were lacking in manpower and the appropriate buildings and materials to safely and securely store the weapons and/or ammunition. No one at these depots could provide a breakdown of the actual costs of running the place as the bills go to the Entity Ministries of Defence. It was suggested by the commanders at the depots that this type of assessment had in any case probably not been carried out due to the poor state of accounting systems. Table 2 contains the financial information that was provided.

Table 2. Assessment of weapon and ammunition storage depots

Depot	Visoko[a] (VF)	Jahorinski Potok[b] (VRS)	Kiseljak[c] (VF)
Weapons and ammunition	14,500 SALW 100 items of heavy artillery Expecting delivery of a further 8,000 to 9,000 weapons. EUFOR considers all stock in Visoko to be surplus[d]	1,400 tonnes of ammunition Status as yet unconfirmed	2 million rounds of ammunition for barracks and training purposes 57–60 tonnes of known surplus ammunition
Staff levels[e]	2 Key Custodians (commissioned officers) 7 Security Guards (soldiers) These are not just assigned to this depot, so estimate of 50% of time for each staff member	2 Key Custodians (commissioned officers) 10 Security Guards (soldiers)	Part of Pale barracks so no dedicated people for depot. In any one shift there are 2 Key Custodians (officer and NCO) and 1 Security Guard (soldiers)
Costs	All bills go to MoD	All bills go to MoD	All bills go to MoD One storage building and 2 sentry posts only

Depot	Visoko[a] (VF)	Jahorinski Potok[b] (VRS)	Kiseljak[c] (VF)
Adequacy assessment	Requires: extra staff; more storage buildings; and appropriate equipment	Inadequate staff levels for security and maintenance. No trained personnel[f]	No extra staff needed, just specialist training. Materials to complete the perimeter fence also required

[a] Interview with Colonel Smail Mešić, Commander of Visoko depot; and Major Jacok Spahić, AFBiH Logistic Command, 29 November 2005.

[b] Interview with Major Zoran Koračević, Chief of Logistics, Jahorinski Potok; and Colonel Miroslav Cvijetić, Deputy Commander of Pale barracks, 30 November 2005.

[c] Interview with Colonel Tomo Kolenda, Commander of Artillery Battalion, Kiseljak, 1 December 2005.

[d] Interview with Colonel Keith Murphy, Verification Liaison Officer, EUFOR Multinational Taskforce North, 29 November 2005.

[e] Staff wages (all net) are: non-commissioned officer: 500–530KM per month (US$309–328); commissioned officer: 720–730KM per month (US$445–452); soldier: 395KM (US$244) per month.

[f] At another depot under the command of Pale barracks, sensitive weapons and explosives are being stored in damp buildings. Requests for help on this from Colonel Cvijetić have not been answered yet. Interview with Colonel Miroslav Cvijetić, Deputy Commander of Pale barracks, 30 November 2005.

There were no alarm systems, no computerized record-keeping and no fire and safety personnel. All commanders expressed the need for investment in safety and security issues: more manpower, better buildings and more building materials. Many expressed concern over the poor conditions in which they had to work.

BRINGING SITES UP TO NATO STANDARDS

The initial huge costs involved in bringing BiH depots up to NATO standards would imply that the number of storage sites should be kept to the bare minimum. As previously stated, given the current amount of weapons and ammunition in the country, there will have to be substantial investment in much more than nine sites if the state of BiH wishes to store

the surplus safely and securely prior to any potential sale (if a buyer can be found).

The spreadsheet on the CD-ROM will allow the defence ministries to assess the costs of these depots after the initial investment has been made into bringing them up to NATO standards. The level of investment required each year to maintain these standards is high.

CONCLUSION

This project has developed a Cost Benefit Analysis Model in order to assess whether the real costs of security and storage of SALW and related ammunition, whilst awaiting a potential sale, will eventually be higher than any possible income from sales. The model was developed based on the requirements of NATO storage standards, and will feed into the development of accounting systems for the ministries of defence in the SEE region. While the model was based on the UK system, which is highly decentralized in terms of responsibility for the financial accounting systems and budgets of each individual storage depot, it is envisaged that the states of the region will converge with this, particularly given their desire for NATO and EU membership.

Testing the model in BiH had its own problems, given that the country is only 10 years out of a civil war, is going through major political restructuring and is currently undertaking a process of demilitarization. However, those interviewed in BiH felt that despite the relative lack of financial and accounting information, which might have been more readily available in other SEE states, the study was timely. Storage depot commanders and key personnel interviewed from the BiH Ministries of Defence expressed interest in the project. While the size of the AFBiH, the amount of weaponry, and the final destinations of future storage sites have yet to be decided, it is hoped that this project will feed into the debate regarding the potential benefits of destroying surplus ammunition and SALW rather than storing it for potential sale.

Although this model was originally commissioned to help states in South-eastern Europe make decisions about the future of their surplus stocks, the model is applicable to all other regions. It is hoped that it will be a useful tool for all ministries of defence that wish to compare the costs of storage with those of destruction, and the potential benefits from sale with the costs of storage.

Notes

1 For more on the Costs of Disarmament project, see <www.unidir.ch/bdd/fiche-activite.php?ref_activite=3>.

2 SEESAC, 2005, *Regional Perspectives of SALW Export Market Opportunities for BiH,* 19 March.

3 Figures are from SEESAC, 2005, *South Eastern Europe SALW Monitor 2005,* at <www.seesac.org/target/salw_monitor.htm>, and Biting the Bullet and IANSA, 2005, *International Action on Small Arms 2005: Examining Implementation of the UN Programme of Action,* at <www.reliefweb.int/rw/lib.nsf/db900SID/KKEE-6E8KTA/$FILE/iansa_small%20arms_2005.pdf?OpenElement>.

4 This excludes the running costs of the Army School of Ammunition, which, if included, would take the figures up to €16.1–17.6 million (£11–12 million) per annum.

5 The model is highly simplified for two main reasons: a) the transaction/transfer costs are not broken down into constituent parts to ensure that the true costs of sale are accounted for in calculating what might be gained from sale; b) determining the rate of sale and the relationship between cost reductions and the rate of sale is difficult. It is almost certain that sales would be in lumps, with blocks of stock sold from time to time; the two scenarios assume that either all are sold at once, or sales are gradual over the course of the period. The relationship between sales and cost savings is a difficult one to calculate. If stocks are sold over a period of time, costs will neither drop in direct proportion to sales, nor will they stay static until all the stocks are sold. This relationship is likely to vary by the nature of the weapons held, and by the specific facilities (e.g. if x amount of weapons are sold off in a depot that has eight sheds, then it may be possible to close and sell off one of the sheds; if they are stored in one shed, then until all stock is sold there can be no closure and sale of storage equipment, though there might be some reduction in cost).

6 Full title: The General Framework Agreement for Peace in Bosnia and Herzegovina.

7 E-mail exchange with Adrian Wilkinson, Head SEESAC, 5 December 2005.

8 Interview with Colonel Smail Mešić, Commander of Visoko depot, and Major Jacok Spahić, AFBiH Logistic Command, 29 November 2005.

9 BiH report for the UN Programme of Action on small arms and light weapons, 2005; interview with BiH MoD, 2 December 2005.

10 Interview with Colonel Keith Murphy, Verification Liaison Officer, EUFOR Multinational Taskforce North, 29 November 2005.

ANNEX 1

EXPLANATION OF HOW THE MODEL CALCULATES

The following explains the algorithms for the SALW Cost Benefit Analysis Model. They also apply in the case of the Ammunition Model.

Summary page

SALW (Destruction) table

1. *Total SALW Stocks* = 'Weapons Storage Data Input'!E6. This is the figure brought forward from the Weapons Storage Data Input page, which is inserted by the user.
2. *Total Annual Storage Costs* = 'Weapons Storage Data Input'!E7. This is the figure brought forward from the Weapons Storage Data Input page. (See no. 17 below for a full explanation of how this is calculated.)
3. *Total Destruction Costs* = 'Weapons Storage Data Input'!E9. This is the figure carried forward from the Weapons Storage Data Input page, which is calculated on the basis of number of weapons multiplied by cost of destruction per weapon.
4. *Annual Storage Costs (Per Weapon)* = D6/D5. This is calculated by dividing *Total Annual Storage Costs* by *Total SALW Stocks*.
5. *Destruction Costs (Per Weapon)* = 'Weapons Storage Data Input'!E8. This is the figure carried forward from the Weapons Storage Data Input page, which is inserted by the user.
6. *Net Benefit from Sale* = 'Weapons Storage Data Input'!E10. This is the figure carried forward from the Weapons Storage Data Input page. (See no. 20 below for a full explanation of how this is calculated.)
7. *Break Even Point (Months)* = (D7/D6)*12. This is *Total Destruction Costs* divided by *Total Annual Storage Costs* multiplied by 12 (to break it into months).

8. *Present Value of Costs over 5 years* = (D10-D7)+D6*(1+'Weapons Storage Data Input'!E123+'Weapons Storage Data Input'!E123^2+'Weapons Storage Data Input'!E123^3+'Weapons Storage Data Input'!E123^4). This calculates (*Net Benefit from Sale* minus *Total Destruction Costs*) plus *Total Annual Storage Costs* multiplied by (Net Present Value multiplier [which is hidden] from 'Weapons Storage Data Input' page plus the same again to the power of 2 plus the same again to the power of 3 plus the same again to the power of 4).

SALW (Sale) table

9. *Total SALW Stocks*. See no. 1 above.
10. *Total Annual Storage Costs*. See no. 2 above.
11. *Total Net Return from Weapon Sale* = 'Weapons Sale Data Input'!E9. This is the figure carried forward from the 'Weapons Storage Data Input' page, which calculates *Total Weapon Sale Return*. (See no. 19 below for a full explanation of how this is calculated.)
12. *Years to Sell Stock*. This figure is inserted by the user.
13. *Months to closure following final sale*. This figure is inserted by the user.
14. *Net Benefit/Cost of Sale (Scenario A)*[1] = D16-((D17/2*D15)+(D15*D18/12)). This is the *Total Net Return from Weapon Sale* minus (*Years to Sell Stock* divided by 2 multiplied by *Total Annual Storage Costs*) plus (*Total Annual Storage Costs* multiplied by *Months to closure following final sale* divided by 12).
15. *Net Benefit/Cost of Sale (Scenario B)*[2] = D16-(D15*D17+(D15*D18/12)). This is the *Total Net Return from Weapon Sale* minus (*Total Annual Storage Costs* multiplied by *Years to Sell Stock* plus (*Total Annual Storage Costs* multiplied by *Months to closure following final sale* divided by 12).

Weapons Sale Data Input page

16. *SALW Stocks*. This is entered by the user.

17. *Total Storage Costs* = I54+E101. This is calculated by adding *Total Staff/Personnel Costs* to *Total Utilities etc*.

18. *Net Return on Sales per Weapon* = E124 (which is E121-E122). This is calculated by subtracting *Transaction Costs of Sale* from *Price per Unit*.

19. *Total Weapon Sale Return* = E6*E8. This is calculated by multiplying *SALW Stocks* by *Net Return on Sales (per Weapon)*.

20. *Net benefit from sale of Infrastructure* = E116 (which is E112-E113). This is calculated by subtracting *Cost of Preparation for Sale* from *Gross Benefit from Sale*.

21. Salaries sections: all figures are calculated on the basis of entry by the user of the *Salary (daily)*, *Number of Working Day*s and *Number of Staff* at that level. Pension and social security contributions are worked out on the basis of 7% and 5% respectively. These are then added up to give *Total Staff/ Personnel Costs*.

22. The next set of tables is calculated on the basis of data entry by the user. These are added together to provide *Total Utilities etc*.

23. *Benefits from Sale of Infrastructure* is calculated on the basis of data entry by the user. *Net Benefit from Sale* = E112-E113. This is calculated by subtracting *Cost of Preparation of Sale* from *Gross Benefit from Sale*.

24. *Benefits from Sale of Weapons* is calculated on the basis of data entry by the user. *Net Benefit from Sale* = E121-E122. This is calculated by subtracting *Transaction Costs of Sale* from *Price per Unit*.

25. *Net Present Value (NPV)* is entered by the user. This is the future stream of benefits and costs converted into equivalent values today. This is done by assigning monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate, and subtracting the sum total of discounted costs from the sum total of discounted benefits.

Weapons Storage Data Input page

26. *SALW Stocks* is entered by the user.

27. *Total Storage Costs* = I54+E101. This is calculated by adding *Total Staff/Personnel Costs* to *Total Utilities etc*.

28. *Destruction Costs (per Weapon)* is entered by the user.

29. Total Destruction Costs = E6*E8. This is calculated by multiplying *SALW Stocks* by *Destruction Costs (per Weapon)*.

30. *Net Benefit from Sale* = E116 (which is E112-E113). This is calculated by subtracting *Cost of Preparation for Sale* from *Gross Benefit from Sale*.

31. See no. 21 above.

32. See no. 22 above.

33. *Benefits from Sale* is calculated on the basis on data entry by the user. *Net Benefit from Sale of Infrastructure* = E112-E113. This is calculated by subtracting *Cost of Preparation of Sale* from *Gross Benefit from Sale*.

34. See no. 25 above.

Notes

[1] Scenario A: Sales are regular over the period in question, and savings are realized in direct proportion to the sale.

[2] Scenario B: No savings are realized until the stocks are completely sold.

ANNEX 2

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ACRONYMS

AFBiH	Armed Forces of Bosnia and Herzegovina
ATO	Ammunition Technical Officer
BiH	Bosnia and Herzegovina
CICS	Centre for International Cooperation and Security
EU	European Union
EUFOR	European Union Force in Bosnia and Herzegovina
KM	convertible marka (BiH currency)
MoD	ministry of defence
NATO	North Atlantic Treaty Organisation
NPV	net present value
OSCE	Organization for Security and Co-operation in Europe
SALW	small arms and light weapons
SEE	South-eastern Europe
SEESAC	South Eastern Europe Clearinghouse for the Control of Small Arms and Light Weapons
UNIDIR	United Nations Institute for Disarmament Research
VF	Federation Army of Bosnia and Herzegovina
VRS	Army of the Republika Srpska