FINAL REPORT

The value of volunteers in State Emergency Services
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afac
Australasian Fire and Emergency Service Authorities Council

SES Australian Council of **State Emergency Services**

Acknowledgments

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Executive Summary

This report presents estimates of the economic value of SES volunteers from NSW, Victoria, South Australia and Tasmania. The study builds on earlier work undertaken for EMA and the NSW and Victorian SES. The present study has been supported by Australian Council of State Emergency Services (ACSES).

Study approach

Data on the activities of SES volunteers over several years in NSW, Victoria, South Australia and Tasmania was provided by the respective SES. This was combined with the detailed information gained from our earlier study to provide a full picture of the value of volunteers.

We use two approaches to estimate the economic value of SES volunteer time: the "global substitution method" where an average wage rate is used to value all activities; and the "task specific substitution method" where each task is valued at its market wage rate.

In both approaches, we value operational tasks and time which includes response and community activities, as well as time spent on training and travel, administration, etc. Time spent on non-operational tasks and on stand-by is based on our original study of the NSW and Victorian SESs where we collected data on these components. When stand-by time is included, it is by far the largest component of time and accounts for nearly half the total value of volunteers even when given only a nominal value per hour. Results are presented in several steps to show the value of the time volunteers provide for each type of activity.

Findings

The value of volunteer time given for community services, operational response, training and unit management – and without stand-by time - over the period from 1994/95 to 2004/05 averaged around $52 and $19 million a year in NSW and Victoria. In South Australia, the value of volunteer time given for community services, operational response, training and unit management over the period from 1994/95 to 2004/05 averaged around $12 million.

The value per volunteer with stand-by time

Volunteer stand-by time accounts for about 94 percent of the total time in NSW and Victoria – based on our original study. Analysis shows that the total time volunteers made available including stand by time is worth more than $86 and $41 million a year for the NSW and Victorian SESs respectively. The values are dependent on the number of volunteers used in the calculations. For NSW the annual value of an individual volunteer was estimated as $15,903 based on the ten year dataset from the SES and drawing where needed on the model of SES volunteer time developed by CRaCS at RMIT.

Time and money

The graphs below summarise the allocation of time and its monetary value using the example of NSW. The graphs highlight the relative important of different volunteer tasks and the usually overlooked stand-by time.

Operational time and for NSW SES (over 10 years)

Operational Hours of SES - NSW
(Average for 94/95 - 04/05)

Fire Support
13%

Flood
9%

Other
Emergencies
9%

Storm
54%

Road Crash
Rescue
4%

Search &
Rescue
11%
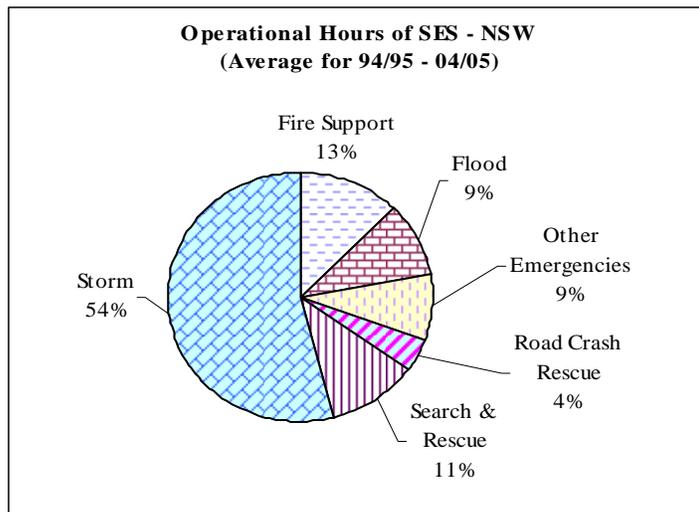
Total active volunteer time and $ value (training is the largest component)

Time Volunteeers Spend for SES Activities - NSW

Unit Mgt. &
Other
Activities
22%

Response &
Recovery
14%

Community
Service
4%

Training
61%

Value of Time VolunteertIme Spend for SES Activities
A$ 52 million a year - NSW

Unit Mgt. & Other Activities 14%

Response & Recovery 16%

Community Service 2%

Training 68%
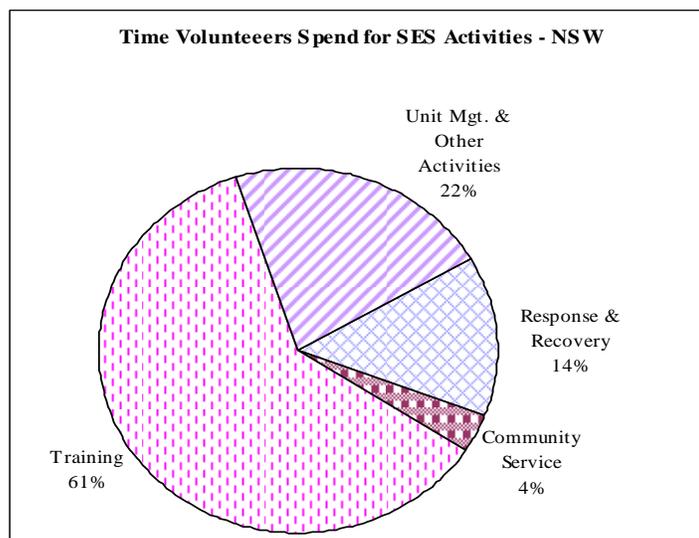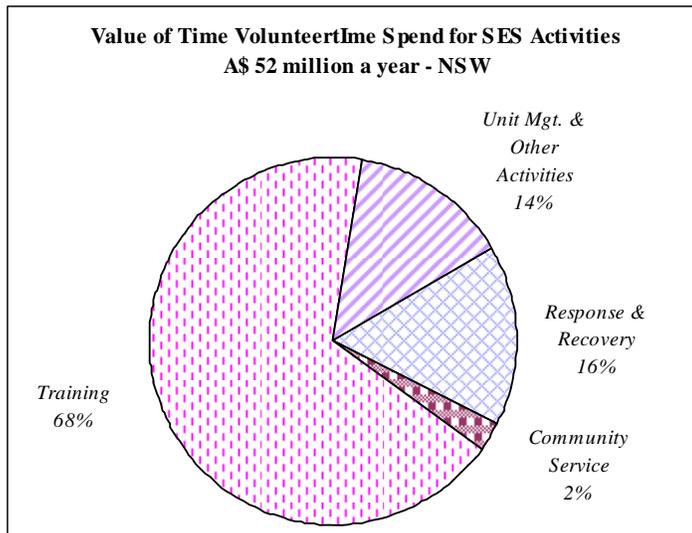
Total time and value including reported stand-by time
(Response is 1% of time, 10% of value)

Volunteeer Time Available for SES - NSW
(10 year average)

Response & Recovery 1%

Community Service 0.2%

Training 4%

Unit Mgt. & Other Activities 2%

Time Available for Response 93%

Value of Volunteeer Available for SES - NSW
(A$ 86 million a year)

Time Available
for Response
39%

Response &
Recovery
10%

Unit Mgt. &
Other Activities
9%

Training
40%

Community
Service
2%
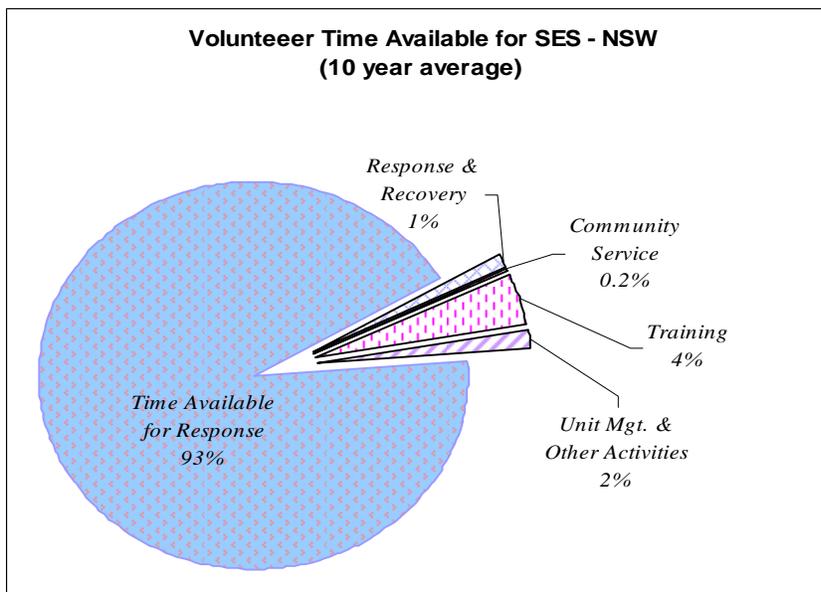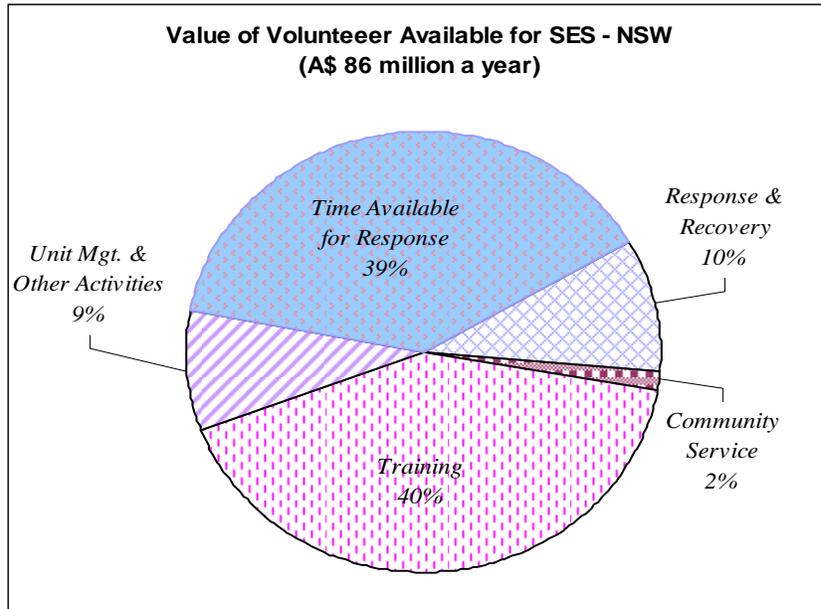
I Introduction

State Emergency Services (SES) are organisations dedicated to assisting communities prepare and respond to unexpected events and play a vital role in confronting the effects of natural and man made emergencies in all states and territories. The SESs are mainly involved with storm operations and flood operations and road crash rescue, and they also provide assistance in search and rescue operations and support for the fulltime emergency response agencies like police, ambulance and fire services. In the absence of institutions like the SES, governments need to provide similar services either by increasing the size of existing emergency services, establishing full-time specialised career institutions, or to buy the services commercially. The last option is not feasible in much of Australia. Such actions required considerable resources, and raise the issue of the value of SES volunteers to communities. This report presents estimates of the value of SES volunteers in NSW, Victoria, South Australia and Tasmania.

There are different views on valuing volunteering time. Opponents for giving value for volunteer work argue that giving value undermines the true value of the service and distorts the meaning and sprit of volunteerism. However, there are many reasons for giving economic value to volunteering (eg. Karn 1983, Dalsimer 1989, Gaskin 2003). Volunteer work has direct economic value to society, which can be expensive and very difficult to replace. Assigning economic value to volunteer activities also provides an opportunity to make valid comparison with other services.

We use two approaches, the "global substitution method" and the "task specific substitution method", to present the economic value of volunteer time for the state emergency services of NSW, Victoria, South Australia and Tasmania. Our analysis captures the time provided by volunteers for response, recovery as well as prevention and preparation for emergencies using different sources of information. The report is organised as follows. First, we present a discussion of volunteer activities in state emergency services. Then we discuss the valuing of volunteer time and present details of the methodology used in the study. Next, the results of the analysis are presented in several steps to show the value of the time volunteers provide.

Data and information sources used

The estimates of the value of volunteer contribution to SES we present here are based on data provided by the state emergency services of NSW, Victoria, South Australia and Tasmania. The table below describes the nature of the information provided by each agency.

State	Data	Period covered	Nature of the data
NSW	Time on response for emergencies and community education	1993/94 – 2005/06	Flood, storm, fire, road crash rescue, search and rescue, other emergency related activities (eg. driver reviver, assist ambulance crew), community education and public relations.
Victoria	Response time in emergencies	1990 – 2005/06	Flood, fire, storm, road rescue, marine and land search and rescue.
South Australia	Time on response for emergencies and community service	2000 - 2006	Flood, storm, operational support for fire and police service, search and rescue, road crash rescue, driver reviver program and support communities at emergency events.
Tasmania	Time on response for emergencies and community education	2001/2002 – 2005/2006	Flood, storm, operational support for fire and police service, search and rescue, road crash rescue, driver reviver program, community education and demonstrations.

Please note that definitions and data collection methods may not be standardised across jurisdictions with the result that the results may not be comparable at a detailed level. In addition, some values used in the analysis are from different years with the result that final values may be up to 8 percent higher than shown.

As the information provided by the different agencies was not collected on the same basis, some alignments had to be made. VicSES provided aggregated data for the period from 1990 to 1994 on a calendar year basis and for financial years 1994/1995 to 2005/2006. NSW SES provided data on individual incidents for the financial years from 1993/1994 to 2005/2006 which was aggregated into categories comparable with those used in Victoria. The data for the year 2005/06 does not cover the complete financial year. Due to the incompleteness of the NSW data for the year 2005/06 and considering the need of maintain consistency in the analysis, it was decided to use data from 1994/95 to 2004/05 from NSW and Victoria. SES data from South Australia is based on calendar years and we used the same format in our analysis. For SES Tasmania, the full range of operational

data are available only for the year 2005/06 and therefore our analysis was limited to that year.

This study builds on earlier work undertaken for EMA and the NSW and Victorian SES: *The social value of volunteerism in the state emergency services.* (CRCS, 2004). This study surveyed all SES units in NSW and Victoria with a response rate of just under 40 percent. The survey information was supplemented by existing datasets held by the SES administrations, by detailed diaries from a small sample of NSW units, and by several in-depth studies of remote-area units. The result was a very detailed picture of how SES volunteers spend their time including details on travel, administration, training, community activities and stand-by time. A brief summary of that study is in an Appendix to this report.

Information from this survey study complements the detailed time series on response activities to provide a full picture of volunteer time.

II Volunteers in State Emergency Services

State Emergency Services (SES) operate in each state and territories to help communities manage a range of events and to enhance community safety. Local SES units are made up almost entirely of volunteers who are the key contributors to the success of the organisations. Volunteers are involved with all aspect of emergency management: prevention, preparation, response and recovery. SES volunteers also act in a supporting role to other agencies such as police, ambulance and fire services.

People make their time available to voluntary organisations for a variety of reasons. Studies around the world cite mutual support and care, response to need, personal beliefs, the idea of giving something back to community, sense of belonging, personal satisfaction and enjoyment, and personal and skill development as important motives for volunteering[1]. Helping others or altruism is the most commonly expressed reason for volunteering. For example, more than 60 per cent of Canadian volunteers rank "helping others" as the prime intention of their participation in volunteering (Colman, 1998). In Australia, a similar motivation inspires very high proportion of volunteers in Victoria (Soupourmas and Ironmonger, 2002). Citing ABS (1990) and Vellekoop-Baldock (1990), the Industry Commission (1995) reports more than 80 per cent of volunteers are motivated with altruism in South Australia and Western Australia. Individuals may become involved in voluntary activities for personal growth and developing career skills that could bring financial and material rewards in the future[2].

Flood, fire, storms and search and rescue operations are the main types of emergencies SES volunteers are involved in. Nevertheless, volunteers spend a lot of time on preparation and prevention programs as well. We present here information on volunteer time spent on different operational tasks and the trends of time spent on each task for the State Emergency Services of NSW, Victoria and South Australia.

NSW SES

Figure 1 shows how volunteer time is allocated between different operational tasks for the NSW State Emergence Service over a ten year period, 1994/95 to 2004/05. Storm related activity is overwhelmingly the single largest response task. Volunteers also spend a considerable amount of their response time on search and rescue including road crash rescue – road crash activities are likely to much more important than storm response in rural and remote parts of the State. Figure 2 shows the trends in time spent on different response tasks over the 1994/95 - 2004/05 period. The Figure shows that there is an slightly increasing trend in the amount of time spent on fire and storm related operations.

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[1] See Soupourmas and Ironmonger, (2002) for a discussion on various reasons for volunteering
[2] Wilson and Myer (2007) shows that individuals involved in volunteering are more likely to be employed and earn more that that of the individual not involved in such civic activities.
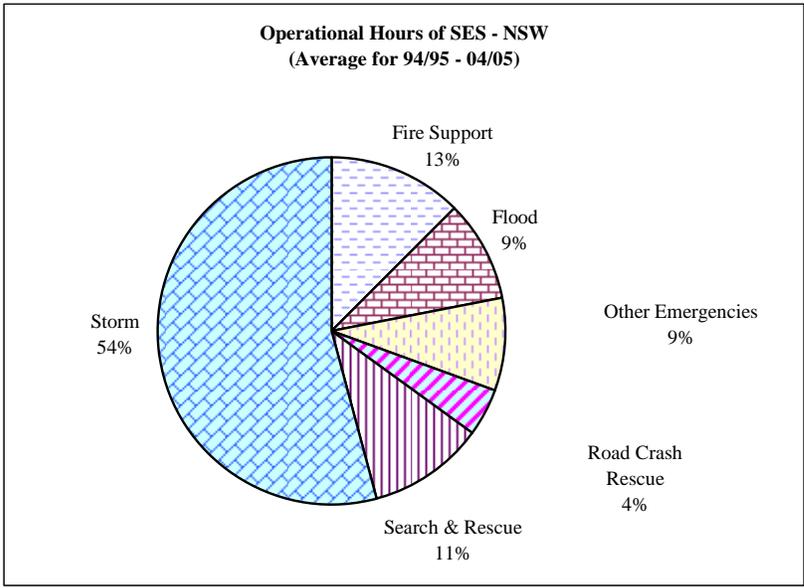
Figure 1:   Volunteer time spent on response operations - NSW
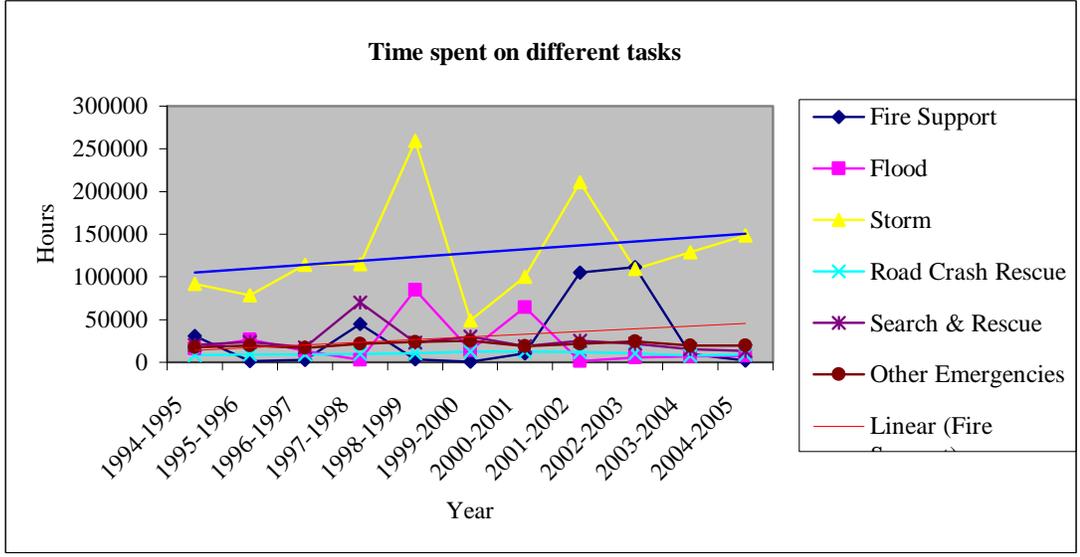
Figure 2: Time trend of NSW volunteer time spent on response operations.

Vic SES

Based on a ten year dataset, Figure 3 shows that SES volunteers in Victoria spend most of their operational time on storm related activities but to a far lesser extent than the NSW SES as shown above. Rescue operations including road crash rescue and search and rescue operations come next in volunteer response time. Road crash rescue is particularly significant at 18 percent of volunteer time.
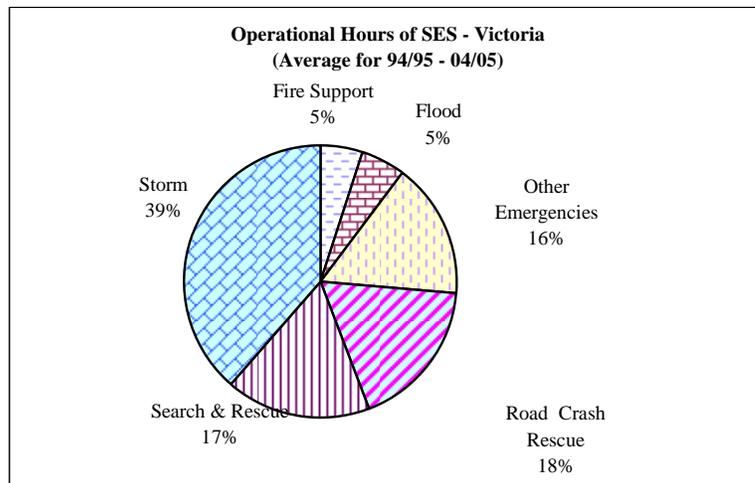
Figure 3: Volunteer time spent on response operations - Victoria

Figure 4 shows trends over time for volunteer activity in Victoria. Most activity levels remain similar, although the operational time for floods shows a slight decline while time spent on storm activity increases over the ten year period**.**
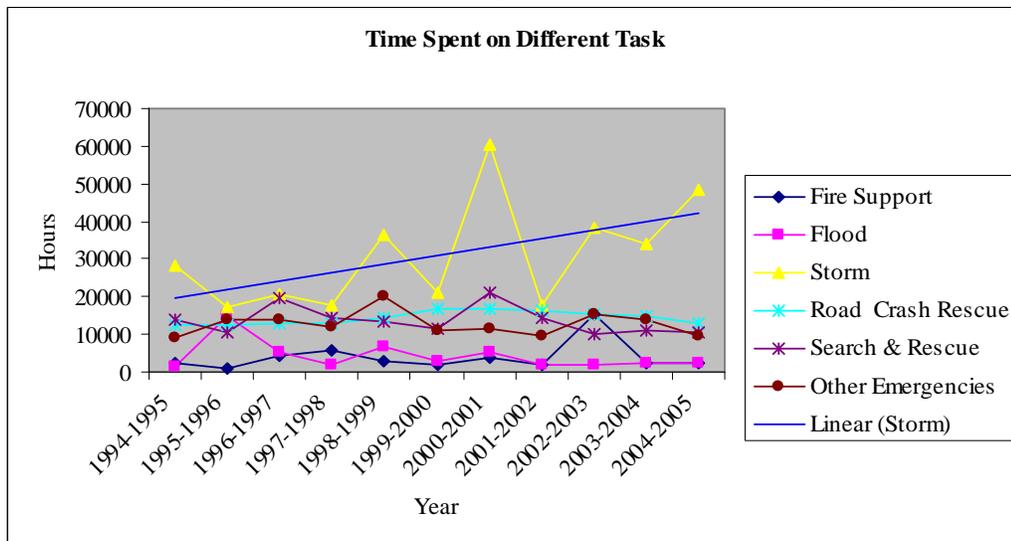
Figure 4: Trends in Victorian volunteer time in response operations.

South Australia SES

The South Australian dataset covers the period 2000 to 2006. Figure 5 shows that as with NSW and Victoria storm work is the largest single response activity for volunteers, although a smaller proportion of their total time. Search and rescue (SAR) and road crash rescue are the next largest consumers of time with SAR taking nearly a quarter of total volunteer time. Figure 6 shows trends in allocation of volunteer response time over the six year period. There may be an increasing trend in the use of time for fire related activities.
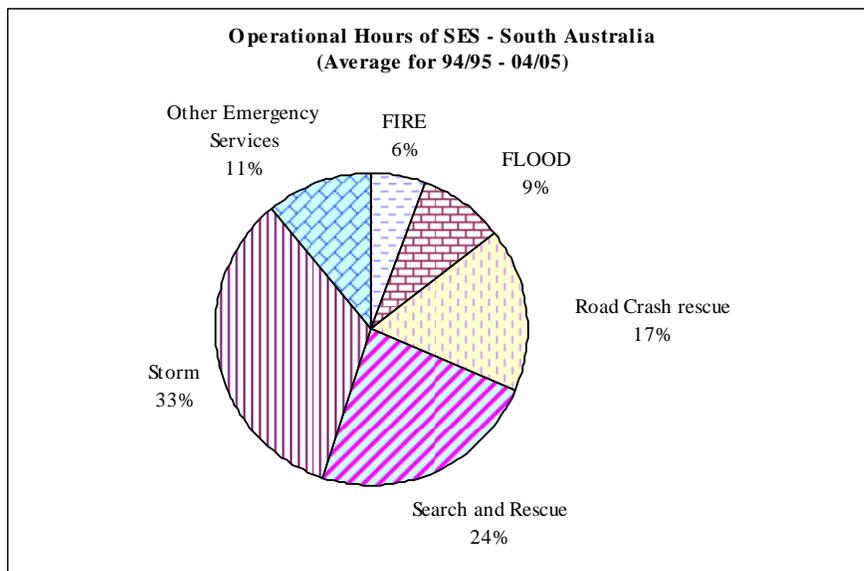
Figure 5: Volunteer time spent on response operations – South Australia
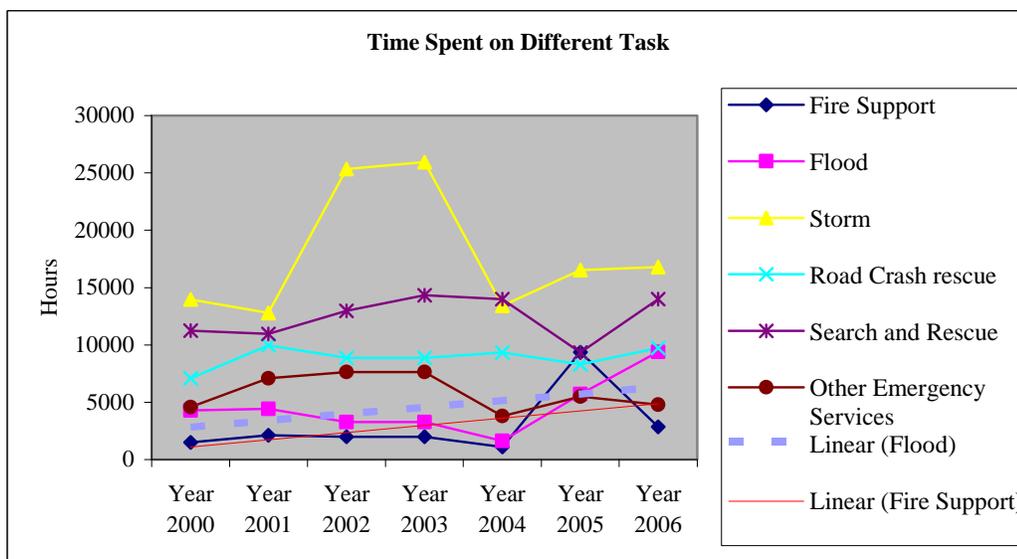
Figure 6: Trends in volunteer time in response operations in South Australia.

State Emergency Service of Tasmania

As mentioned in the section on data earlier, the Tasmanian data for all areas of operations is only available for one full year. So we are limited to graphing the activities for 2005/2006, as in Figure 7. This shows that time is reasonably evenly divided between search and rescue, road rescue and support to the police and fire services. Insufficient trend information is available to graph.

**Operational Hours of SES - Tasmania
(Year 2005 - 2006)**

Support to Fire and Police Service 24%

Road Rescue 28%

Storm 8%

Flood 10%

Search and Rescue 30%
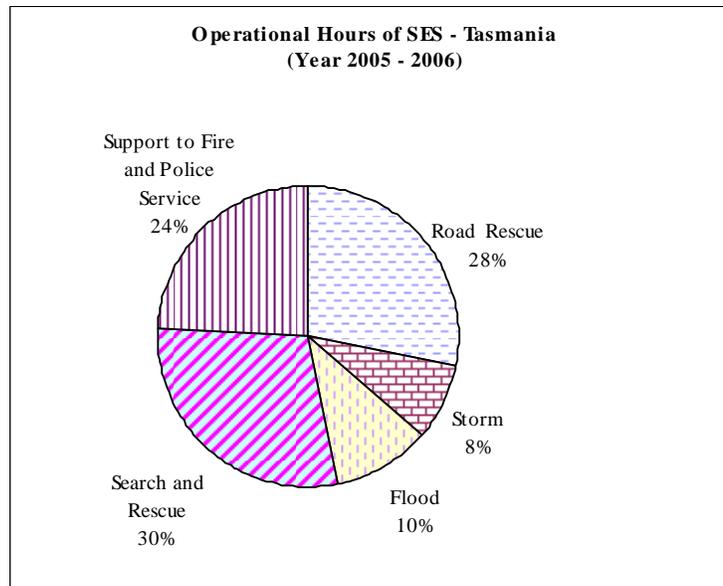
Figure 7:   Volunteer time spent on response operations – Tasmania

III Volunteer time

The use of volunteer time in emergency management organisations is quite different to the other formally organized volunteer bodies such as charity or community groups. SES volunteers spend much of their time on training, prevention and preparation programs in addition to response operations. For example, community education on bushfires, and driver reviver programs during the peak holiday season, are some of the activities volunteers work in to reduce the consequences of emergencies and to promote community safety. Volunteers themselves run SES units in many areas requiring time for administration functions, meetings and other activities associated with the functioning of the organisations. Our earlier work showed that a significant proportion – over half - of their time is spent on training programs. In some cases this training is very specialised as with road crash rescue.

Most importantly, volunteers in emergency service organisations undertake their normal work and domestic routines while being ready for immediate response – usually known as being on "stand by". Often volunteers need to meet certain conditions to be on stand-by such as limited out of area travel and restrictions on alcohol consumption. Stand-by volunteers are a key factor behind the capability of State Emergency Services to respond more or less immediately to request for assistance. At the majority of SES units (61% according to the CRACS study, Percovich and Handmer 2004), certain volunteers are on stand-by. Thus, in assigning a total value for volunteer time, it is important to include the value of training, administration and stand-by time – aspects of volunteer "activity" that are usually overlooked.

IV Measuring the economic value of volunteering

Assigning an economic value for volunteer time provides a way of comparing volunteering with other pay-for-service or market activities. An economic value for the contribution of volunteers can justify the cost of training and equipping volunteer organisations (Rhenborg and DeSpain 2003), and may help enhance recognition of the contribution of volunteers to society thereby enhancing the idea of volunteerism (Goulbourne and Embuldeniya 2002, Smith and Ellis 2003). An economic value may also be useful in public relations, in funding bids and in contract negotiations (Gaskin, 2003).

In standard economic theory, the measure of economic value of any good or service is based on individual preferences and choices. The value of a particular good or service is measured by the amount of some other good or service that a person is willing to give up in exchange for the particular good or service under consideration. Money is accepted as the indicator of value in a market economy since the amount of money a person is willing to pay for a good or service indicates the amount of other things to be given up in exchange for that good or service. Considering SES volunteers are motivated by certain social outcomes that generate individual satisfaction, the value of individual contributions to SES volunteering can be approximated by using a measure of value volunteers forgo during the time given to SES activities.

This provides the basis for *input* related methods of valuing volunteer time (input being the time volunteers contribute), while the alternative *output* approach to valuing is based on the imputation of market prices to the goods and services produced by volunteers. There are considerable differences in the data requirement and the complexity of these two approaches.

Output Method

The output method attributes value to the good or service volunteers produce, and thereby provides the replacement value of the services with a market based mechanism. The output method is conceptually based on the approach used to value production of marketable goods and services (de Vaus, Gray and Stanton, 2003).   This method relies on the availability of a comparable market value for a particular service. Usually this requires for comparison the existence of a profit-driven company that sells (and hence provides a market value for) a similar service to that of volunteers.

The use of the output method for valuing certain volunteer activities is problematic as there are often no organisations that offer the same service for a fee (Ziemeck 2002). The use of market prices for outputs may also be challenging for a volunteer organisation that performs a variety of tasks due to a lack of data on the specifics of the various activities (Roy and Ziemek undated). Collection of such data requires both high level capabilities in information management and the time to undertake a task that for many volunteer groups will be a low priority. There are professional organisations that perform some of the tasks of the SES (i.e.

Metropolitan Fire Brigades perform road crash rescue), but this is in a metropolitan rather than rural and remote context. However, in Australia at least, there are no commercial organisations carrying out the work of SESs. Thus the output method is of limited use in valuing SES volunteers. Nevertheless, the economic value of volunteer outputs may be of use in justifying the resources provided for SES activities.

Input Methods

Input methods are based on an imputation of value to time worked by volunteers. There are three approaches to achieving a value for volunteer time under the input method as outlined below.

Opportunity cost method: This method attributes value according to the value of activities foregone by individual volunteers when donating time. This would potentially yield a wide range of estimates depending on the skills of and opportunities foregone by individual volunteers, as well as the individual socio-economic circumstances of volunteers. Thus it is impractical to use the opportunity cost approach for valuing volunteer contributions in large organisations like the SESs that have a very diverse group of volunteers. The Australian Bureau of Statistics (ABS) has argued that the opportunity cost should not be based on the forgone wage but on the value individuals place on leisure since individuals may contribute for volunteer activities only in their leisure time (ABS 2002). However, this proposition does not hold with emergency services as volunteers often respond during work hours.

Global substitution method: A 'global' hourly rate is attributed to all volunteer activities by using the cost of hiring a paid (non-specialised) worker to complete a volunteer's tasks. This method is widely used because of its simplicity, and typically employs an average wage figure. As a result estimates of value may be low in the absence of allowance for specialised skills and activities.

Specialised substitution method: This approach uses the relevant wage of a specialist with appropriate skills for the task. It is important to find an appropriate wage-rate for both this and the "global" methods. Both Dalsimer (1989) and Goulbourne and Embuldnyia (2002) particularly emphasised the need to avoid minimum wages for the valuing exercise, as this is likely to result in substantial underestimates of volunteers' contributions. The global substitution approach is convenient in practice but provides lower bound estimates compared to specialised substitution approaches that generate a more complete picture, albeit with a lot more time and effort for the analysis. The two approaches trade accuracy for practicality and therefore the choice should be to match the objective of the valuing exercise with an appropriate approach. Accuracy may be desirable for valuing volunteer contributions, but achieving this accuracy may not be practicable within the resources available, particularly for larger volunteer organisations.

Our Approach

Researchers are in favour of non-opportunity cost based input approaches for empirical work on valuing volunteer time. For example Dalsimer (1989) and Goulbourne and Embuldniya (2002) have noted the advantages of input approaches for empirical studies compared to the more extrapolative output method. Accordingly, we employ two input based approaches to value volunteer time for the present study with the purpose of presenting a comprehensive picture of the value of SES volunteer activities.

Task-specific substitution method: This method is a modification of the specialised substitution method allowing us to achieve a reasonably accurate estimate while avoiding the computational difficulties of using specific wage rates for every volunteer task. Task specific substitution method first identifies a number of different tasks volunteers perform[3] based on the similarities of the work and skills required to perform the job. Then a position description for each task is established and an appropriate wage rate is approximated from paid positions with similar position description of the task. It provides a simplified computational process as fewer wage rates are used in the analysis. For example, time spent on road crash rescue will be valued at a specialist (fire fighter) wage rate while time spent catering will be valued at a different (caterer's) rate even though these activities are performed by the same volunteer.

This approach has two advantages over the other input methods discussed above. Firstly it accounts for the diverse range of activities of volunteers, but avoids attempting to attribute job descriptions to all volunteer activity. Secondly, it uses readily available wage-rates and existing professional position descriptions avoiding the need to classify the diverse activities of individual volunteers into more limited position descriptions. Central to this method is the assumption that volunteers with different professional backgrounds and different paid work could perform a diverse range of activities in the SES. We contend that this assumption is valid for the SES due to the large size of the organisation and the very diverse backgrounds of its volunteers. In the approach, it is assumed that volunteers are equally as productive in performing a particular task as those paid to do similar tasks outside the SES.

Global substitution method: A second input method has been used in this study with the aim of further simplifying the process of volunteer valuation. This method simply tallies all volunteer hours recorded and multiplies by the average Australian wage. This method provides a lower bound estimate with little effort.

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[3] We also identify importance of volunteer time given for agency by means of stand by time and value in appropriate terms. This issue is discussed in the next part the report.

V Economic value of SES volunteers

The use of appropriate wage rates and the capture of the actual time volunteers make available for emergency services are key factors in calculating an estimate of the economic value of volunteer time. The expression "make available" is important as this implies the inclusion of time on stand-by when not actually active, but ready to go.

As explained previously, we use two approaches to assign economic value for volunteer time. The task specific substitution method aims to provide more comprehensive information on the value of volunteer contribution while the global substitution method presents lower bound estimates of the value of volunteer time. Collecting information on the details of the time volunteers make available for emergency services remains a difficult practical task in contrast to the conceptual complexity of identifying the appropriate wage rates for assigning value. Thus we present the economic value of SES volunteer time in several stages capturing the diversity of the commitment volunteers make. In these stages, we combined operational data provided by the SESs with survey information from our previous study to generate a comprehensive picture of the actual time volunteers make available.

Choice of Wage Rates

The relevant wage rate for the global substitution method is estimated from full time adult earnings. For comparison between the methods we have used the Australian average hourly rate of just under $24. (This was the rate at the time of the earlier study. Today the average hourly rate is about $ 28.71 using the earnings of full time employed adult in the year 2006 and assuming 38 hours of work per week (ABS, 2006) – but applying it would require recalculation of all the task specific wage rates and associated calculations.)

The integrity of the task specific substitution method relies on the accurate matching of professional position descriptions and wages to volunteer tasks. In the present study, we follow the approach used in the previous report of the Centre for Risk and Community Safety, and use the same wage rates selected for each position description using the relevant industrial awards and agreements effective in Victoria as shown in Table 1.

Table 1: **Position description and wage rate equivalents of SES volunteer tasks**

Volunteer Task/Activity	Position Discription	Wage Rate (A$/hr)
Response / Operations		
Storm	Construction Worker 3	35.05
Flood	Qualified Lead Fire Fighter	35.05
Road Crash rescue	Qualified Lead Fire Fighter (special rates)	38.04
Search and Rescue	Qualified Lead Fire Fighter	35.05
Fire Support	Qualified Lead Fire Fighter	35.05
Other	Qualified Lead Fire Fighter	35.05
Training	Qualified Lead Fire Fighter	35.05
Community Service	Community Development Worker (Class II)	24.30
Unit Management & Associated Activities	Victorian Public Service (Non Executive Band 1)	20.69

Source: The Social Value of Volunteerism in the State Emergency Services,
 Centre for Risk and Community Safety, RMIT University (2004)

There are differences in wage rates among states and territories but the use of wage rates from one state simplifies the task and provides consistency when comparing the value of different tasks.

Volunteer Time

Data provided by the SES agencies accounts for the time spent on response only, and the time volunteers provide for other activities such as training, community programs and stand-by is not available for analysis from this data source. Alternative approaches are needed to derive estimates of the time volunteers contribute for these and other non-operational activities. In order to do so, we combine the actual data on time given for operational activities (see Table 1) with some results obtained from the survey conducted previously in NSW and Victoria (Percovich and Handmer 2004). This approach helps to avoid the problem of having potentially seriously incomplete information on time allocation with possibly a small sacrifice in accuracy. Improving accuracy would involve very detailed data collection on all volunteer time which would probably be a major imposition on volunteer units and might be impractical.

We next present the economic value assigned for volunteers' time in the state emergency services of NSW, Victoria, South Australia and Tasmania using the two approaches identified above: the task specific and global substitution approaches. Tables 2 and 3 give detailed information on the value of volunteer time in the NSW and Victoria SESs for the period from 1994/95 to 2004/05 using the task specific substitution method. Table 4 gives the annual value of volunteer time given for each response task for SES of South Australia. Table 5 presents

the value of operational time only for the SES of Tasmania using the limited data available.

Using the global substitution method, Table 6 reports the value of volunteer time for NSW, Victoria and South Australia. (Tasmania is not included as its data set is very limited.) This method results in a lower value as expected given that the wage rate used is significantly lower for many of the tasks performed, and for most of the hours contributed, by volunteers.

There are differences in the value of the operational contribution depending on the nature of the operation involved and the extent of emergencies occurring in a given year. According to the data provided by NSW there is not much variation in the time spent on community programs over the ten year data period. The time spent on training and unit management has been generated based on the earlier CRACS study (Percovich and Handmer 2004). It has been treated as a function of operational time whereby more operational activity is assumed to generate additional training through the year and vice versa. If training was treated as a fixed time commitment based on the CRACS survey, its value would probably rise.

We then calculated the average values for the 10 year period from 1994/95 to 2004/05 for NSW and Victoria. These estimates graphically shown in Figure 8 indicate that the time SES volunteers provide is quite significant in terms of money value. The Figure shows that overall volunteers spend most of their time on training programs followed by operational and unit management activities. The value of volunteer time given for community services, operational response, training and unit management over the period averages out at around A$52 and 19 million a year in NSW and Victoria (task specific method). In terms of response, SES volunteers in NSW contributed most for storm related emergency operations providing about 4.5 million worth of time, followed by bushfire related operations worth about A$1 million a year on average over the ten year period. In Victoria, the value of volunteer time given for storm operations is the highest among operational activities and worth over A$1 million a year on average for the period, although road crash rescue is also important. Figure 9 shows the average value of volunteer time for the period from 2000 to 2007 for South Australia is about 12 million dollars a year.

Table 2: **Value of volunteer time for various activities of the State Emergency Service of NSW** **(Task Specific Substitution method is used)**

Australian Dollars

Year	Bush Fire Support	Flood	MISC	Road Crash Rescue	Search and Rescue	Storm	Community Education	Training*	Unit Management & Other Activities*	Total (Annual)
1994-1995	1086235	559048	614777	298871	774076	3211596	1449045	27930040	5888247	41,811,935
1995-1996	43217	943476	685648	320287	909042	2754790	1405568	24058493	5072042	36,192,562
1996-1997	100313	474191	580393	330732	674373	4001553	1237228	26313750	5547498	39,260,032
1997-1998	1570626	98981	750666	354531	2675087	4031731	1545944	39938148	8419811	59,385,526
1998-1999	132559	2963372	826479	372932	868073	9090077	1297015	61105739	12882390	89,538,636
1999-2000	31825	484181	876601	448780	1133782	1716153	1143698	19824884	4179507	29,839,412
2000-2001	376647	2264440	665564	437529	732879	3520317	1152146	34202092	7210529	50,562,143
2001-2002	3690309	41710	766894	414011	948756	7399896	1380179	56805546	11975818	83,423,118
2002-2003	3909898	187763	857814	361015	819306	3830054	1239919	42652399	8992033	62,850,200
2003-2004	355933	246402	675764	280856	591978	4519347	1147489	28533073	6015379	42,366,220
2004-2005	80685	264943	697320	328068	513920	5201630	1407393	30352739	6399003	45,245,702
10 year Average	*1034386*	*775319*	*727084*	*358874*	*967388*	*4479741*	*1309602*	*35610627*	*7507478*	*52,770,499*

* Estimated from survey results

MISC = Other Activities (i.e. driver reviver, animal rescue, evidence search, public relations, etc.)

Table 3:   Value of volunteer time for various activities of the State Emergency Service of Victoria (Task Specific Substitution method is used)

Australian Dollars

Year	Fire Support	Flood	MISC	Road Rescue	Search and Rescue	Storm	Community Service*	Training*	Unit Management & Other Activities*	Total (Annual)
1994-1995	79984	52189	311980	428591	534957	996997	1334678	10177571	2145648	16,062,597
1995-1996	37223	519897	480465	429923	404822	606610	1382396	10541444	2222361	16,625,141
1996-1997	153764	183136	494485	453722	754638	722240	1526758	11642273	2454439	18,385,456
1997-1998	195404	71432	423965	446327	539369	615758	1270962	9691702	2043217	15,298,136
1998-1999	107744	230559	710288	507839	510345	1274804	1865021	14221694	2998236	22,426,529
1999-2000	61653	102907	388249	591399	439020	731353	1288030	9821851	2070655	15,495,116
2000-2001	129755	178650	403355	592871	794123	2111272	2343013	17866613	3766662	28,186,315
2001-2002	72904	61723	341983	571140	543706	625713	1228352	9366784	1974717	14,787,021
2002-2003	529886	60917	544432	545799	375759	1344693	1904839	14525324	3062247	22,893,896
2003-2004	77951	84961	495186	519686	426428	1200638	1565546	11938052	2516795	18,825,245
2004-2005	79283	91796	341597	452040	402806	1700100	1715036	13077985	2757118	20,617,761
10 year Average	*138686*	*148924*	*448726*	*503576*	*520543*	*1084562*	*1584058*	*12079208*	*2546554*	*19,054,838*

* Estimated from survey results

MISC = Other Activities (i.e. driver reviver, animal rescue, evidence search, public relations, etc.)

Table 4: **Value of volunteer time for various activities of the State Emergency Service of South Australia (Task Specific Substitution method is used)**

Australian Dollars

Year	Fire Support	Flood	Road Crash rescue	Search and Rescue	Storm	Other Emergency Services	Community Services	Training*	Unit Management*	Total
2000	52435	150785	269399	394558	489508	160179	642905	6442966	1358314	9,961,050
2001	74411	154641	379145	384393	447834	248014	581645	7144894	1506296	10,921,272
2002	69820	114789	337529	455159	888623	267747	587380	9076893	1913602	13,711,541
2003	69820	114789	337529	502617	909793	267747	587380	9372521	1975927	14,138,121
2004	38169	56711	354761	490174	470406	132524	446950	6525555	1375726	9,890,977
2005	327858	199435	315314	326841	579412	192425	500799	8255688	1740475	12,438,244
2006	100138	329155	370357	490314	588174	167364	484591	8685994	1831192	13,047,279
7 year Average	*104664*	*160043*	*337719*	*434865*	*624821*	*205143*	*547378*	*7929216*	*1671647*	**12,015,498**

* Estimated using survey results for NSW and Victoria

Table 5: Value of volunteer time for various activities of the State Emergency Service of Tasmania (task specific substitution method is used)

Year	Road Rescue	Storm	Flood	Search and Rescue Operation	Assist Fire & Police Services	Community Programs	Total
2001-2002	38590		19558	37317			**95,465**
2002-2003	58463		17876	267345			**343,684**
2003-2004	80825		73009	26970			**180,805**
2004-2005	96072	20014	3155	88101	13845		**221,185**
2005-2006	76094	22502	28355	84639	65614	129402	**406,606**

Table 6: Value of volunteer time for SES NSW and Victoria (global substitution method)

Year	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	10 Year Average
NSW	32,927,508	28,363,232	31,022,018	47,084,204	72,039,270	23,372,112	40,321,806	66,969,652	50,284,110	33,638,440	35,783,696	41,982,368
Victoria	11,998,624	12,427,604	13,725,402	11,425,820	16,766,354	11,579,256	21,063,452	11,042,764	17,124,312	14,074,104	15,418,004	14,240,518

Year	2000	2001	2002	2003	2004	2005	2006	7 Year Average
South Australia	7,595,794	8,423,316	10,701,004	11,049,528	7,693,160	9,732,862	10,240,162	9,347,975

A$ 52 million a year - NSW

Training, 35610627, 68%

Unit Mgt. & Other Activities, 7507478, 14%

Operational, 8342791, 16%

Community Service, 1309602, 2%

A$ 19 million a year - Victoria

Unit Mgt. & Other Activities, 2,546,554, 13%

Operational, 2,845,017, 15%

Training, 12,079,208, 64%
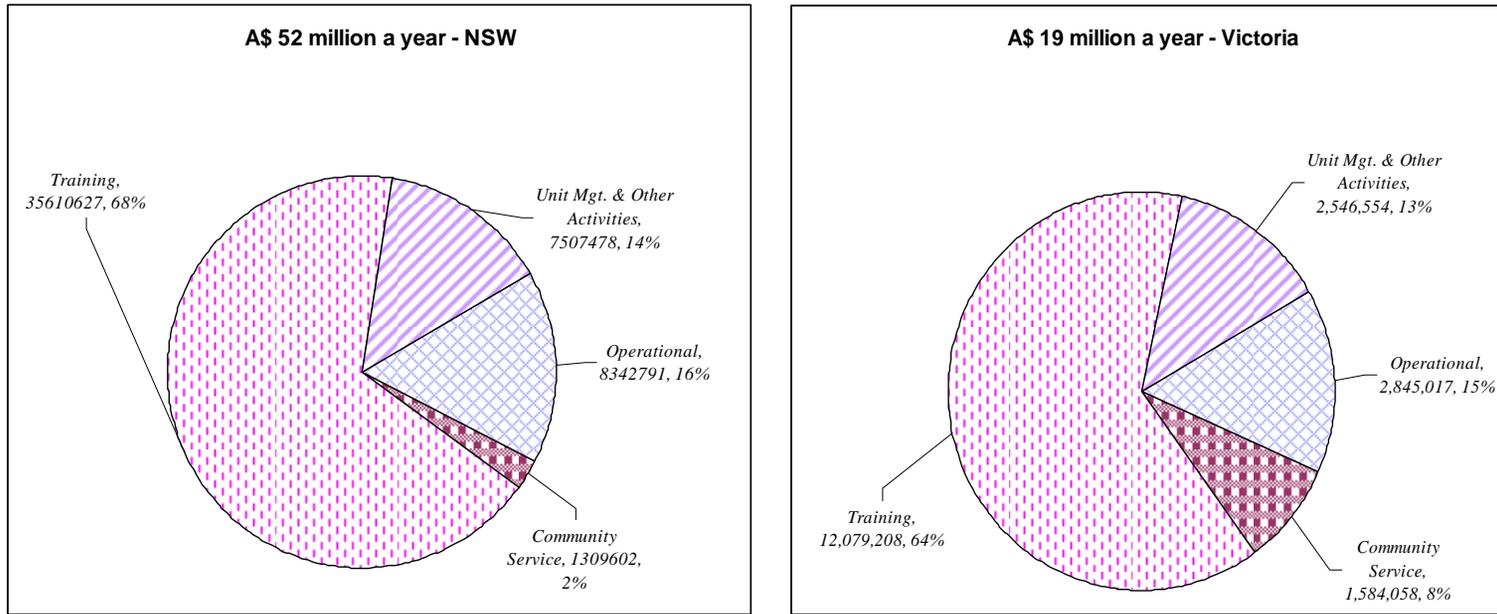
Community Service, 1,584,058, 8%

Figure 8:   Value of volunteer time for State Emergency Service activities (10 year average)
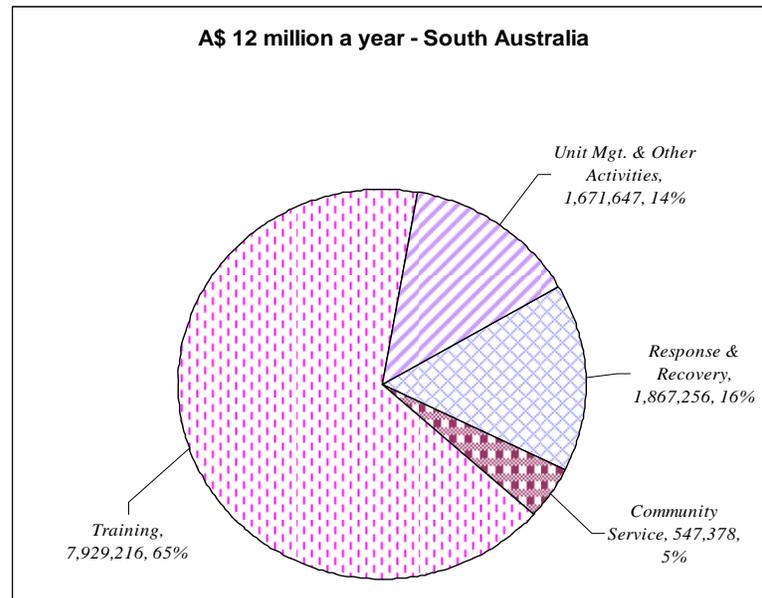
Figure 9:   Value of volunteer time for State Emergency Service activities – South Australia (7 year average)

Stand-by time

Neither the global substitution nor the task specific approach takes account of stand-by time, and the time valued so far does not include any allowance for stand-by.   Nevertheless, the ability of State Emergency Services to respond to an emergency is largely related to the rapid availability of volunteers – in other words volunteers on stand-by. Some functions, such as road crash rescue, would not be possible without stand-by arrangements. We obtained the time value of stand-by arrangement for SES volunteers in NSW and Victoria from the previous CRCS study[4]. This showed that 61 per cent of active volunteers were involved in stand-by arrangements. (The proportions of active volunteers involved in stand-by arrangements for NSW and Victoria were found to be 57 per cent and 75 per cent respectively.) Volunteers on stand-by typically had to comply with various conditions to ensure rapid turnout.

Some emergency services practitioners contend that 'stand-by' time should be valued through comparison with emergency service professionals' wages; that is, volunteer 'stand-by' time is considered equivalent to, for example, having firefighters present at a firestation in readiness for an emergency, and hence should be valued at the wage-rate of firefighters (Collett, pers. comm., 2003). This valuing method was rejected as it appeared to overvalue 'stand-by' time, as there is a clear distinction between opportunity costs incurred on stand-by time spent at a place of work (such as a fire station) and stand-by time carried

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[4] The value is based on the average stand by time per volunteer estimated from the survey times the number of active volunteers of SES in the year that survey is implemented.

out at a location of the volunteer's choosing. For example, if on stand-by at home, it would be possible to engage in leisure activities that would be unlikely at a fire station. Nevertheless, in some circumstances it may make sense to use a career wage. For example, on total fire ban days when Victorian CFA stations are fully staffed by volunteers ready for a call-out, it may be appropriate to use a career fire-fighters wage rate. However, we have not done this here.

An alternative method for valuing stand-by time was used in a report on the Tasmanian ambulance service completed by management consulting firm KPMG (KPMG 2001). In this report, 'on-call' time was calculated at $1.68 per hour, based on an 'on-call' allowance paid by the Tasmanian Ambulance service to professional paramedics. This method is in keeping with the substitution of market wage rates with volunteer tasks, and hence is favoured in this report. This rate of pay was directly comparable to emergency services work carried out by SES volunteers, after being adjusted for one year's inflation[5] to $1.73 per hour.

No specific data were collected concerning the amount of time spent on stand-by by volunteers. In the absence of these data, it was estimated (in consultation with the NSW and Victorian SESs) that all active SES volunteers were on stand-by at all times except those hours spent at places of employment and those hours spent on other SES volunteer activities. Thus the total weekly time spent on stand-by was assumed to be 120 hours per active volunteer per week. In sum, the assumed pecuniary contribution of each volunteer on stand-by was AUD$207.60 per week, or AUD$10,795.20 per year. Under the assumption that the empirical data recorded in the surveys were representative of all SES units throughout the year, the pecuniary value of volunteer contributions during the survey period was extrapolated to an annual value for all NSW and Victorian SES.

It is important to interpret the diagrams of time and value with due consideration to the nature of the information used, since we combine the value of volunteer stand-by time (and training and other non operational tasks) estimated for a year based on a two week survey (Percovich and Handmer 2004), with long term data on operational activities.

In this analysis, we use the value of volunteer time derived from the task specific substitution method for all activities apart from stand-by time. Total time volunteers offer to SES either in the form of stand-by time or operational, unit management or training activities and their economic value are graphically presented in Figures 10 and 11 for NSW and Victoria. We did not extend this analysis to South Australia as we do not have the necessary information on volunteer membership.

The volunteer time from stand-by arrangements constitutes the largest proportion of volunteer time accounting for about 94 percent of the total time in

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[5] Inflation was approximately 2.8 % for 2000/2001(D. Colosimo, pers. comm. 2004)

NSW and Victoria. As a result of the large time commitment of volunteers for stand-by, the economic value of the time provided increases markedly even though only a nominal value is used per hour of stand-by. When stand-by time in included, the value of the time provided by SES volunteers in NSW increases by about 65 per cent while the change in Victoria is more than 100 per cent. Figures 9 and 10 show that the time volunteers made available for the NSW and Victorian SESs is worth more than $86 million a year and more than $41 million a year respectively.

VI Concluding Remarks

This report presents estimates of the economic value of volunteer activities of the State Emergency Services to communities in NSW, Victoria, South Australia and Tasmania. In the absence of institutions like the SES that sources its human resources through volunteers, government needs to provide equivalent services through paid staff r private contractors – both approaches require significant resources. This raised the issue of estimating the value of the SES volunteers. Assigning economic value to volunteers activities also gives the opportunity to make valid comparisons with other services.

We use two basic approaches "global substitution method" and "task specific substitution method" to estimate the economic value of SES volunteer time for NSW, Victoria, South Australia and Tasmania. In addition, estimates of the value of stand-by time are included. Nevertheless, this work does not look at the indirect or secondary benefits that may arise through volunteerism as explained through social capital theory.

This analysis reveals that the time volunteers provided for operational activities and community programs is quite small compare to the time allocated for training and unit administration. More significantly, the stand-by time of SES volunteers is the largest component of the total time spent by volunteers and about half the total value for Victoria and 39 percent for NSW as shown in Figures 10 and 11.
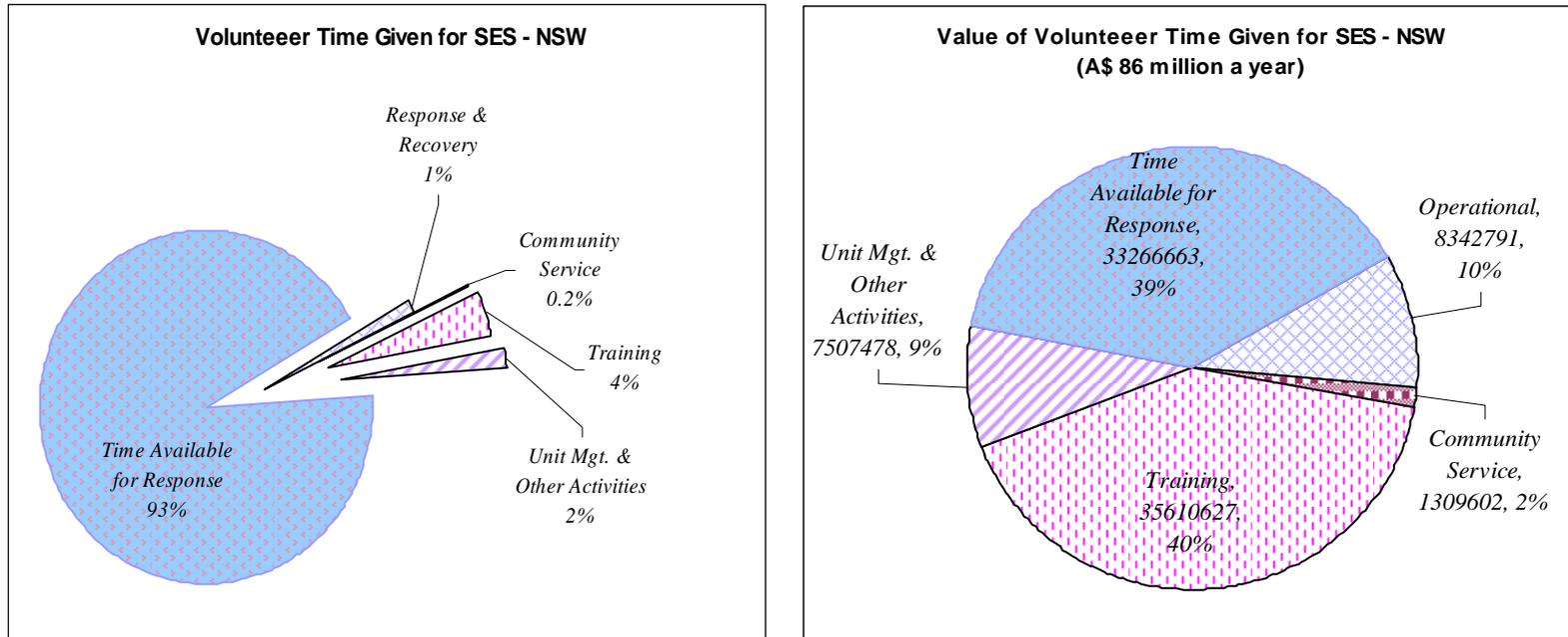
Figure 10:   Volunteer Contribution for the State Emergency Services – NSW. Note that figures have been rounded and may not add up to 100%.

Volunteeer Time Given for SES - Victoria

Response and
Recovery
1%

Community
Service
1%

Training
3%

Unit Mgt. &
Other Activities*
1%

Time Available
for Response
94%

**Economic Value of Volunteeer Time Given for SES -
Victoria (A$ 41 million a year)**

Time Available
for Response,
21,969,548,
54%

Operational,
2,845,017, 7%

Community
Service,
1,584,058, 4%

Unit Mgt. &
Other Activities,
2,546,554, 6%
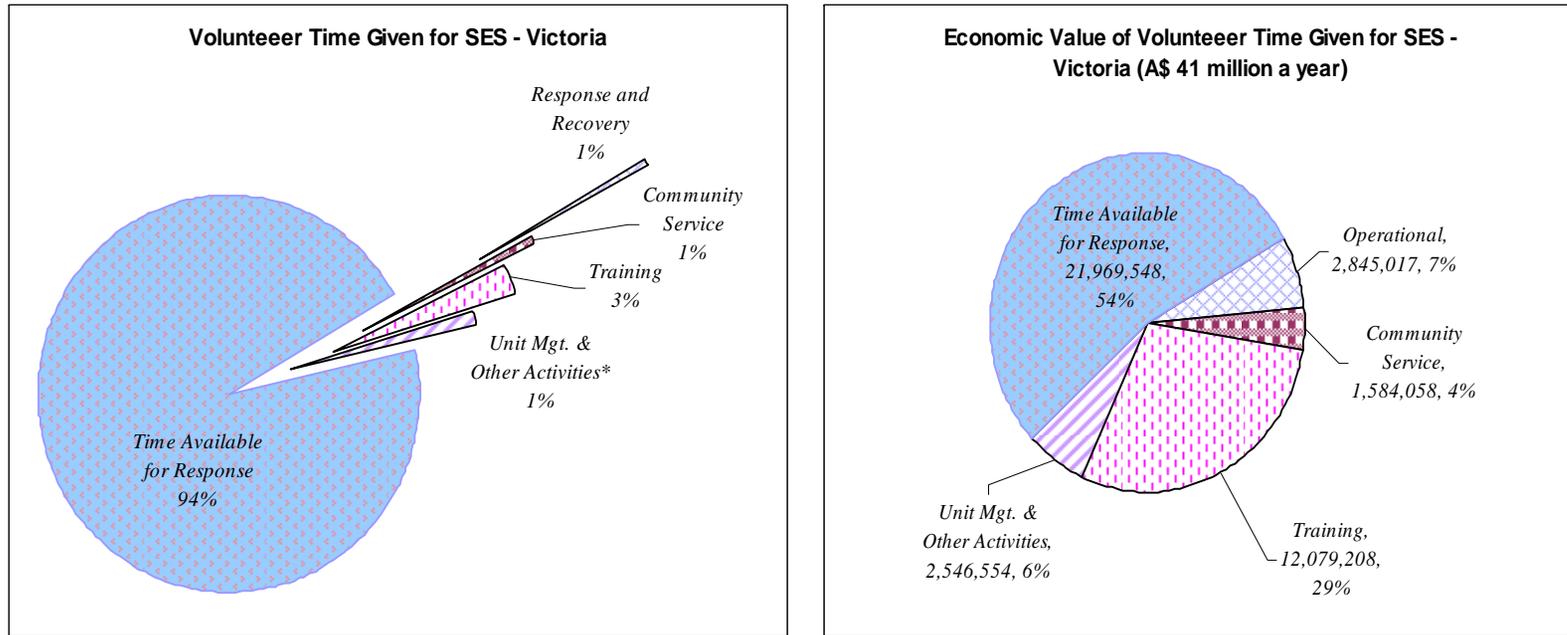
Training,
12,079,208,
29%

Figure 11:   Volunteer Contribution for the State Emergency Services - Victoria

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Appendix: Summary of the CRACS Study

Study approach
Mail surveys of SES units were the most important data source. Slightly less than 40% (140 completed surveys) of all SES units in NSW and Victoria responded to these surveys. The survey information was supplemented by existing datasets held by the SES administrations, by detailed diaries from a small sample of NSW units, and by several in-depth studies of remote-area units.

Research procedures were refined through consultation with senior SES State Headquarters and regional staff in both states. SES staff were closely involved in the creation of the project's survey instruments and in encouraging volunteers to participate.

Two methods were used to value this time contributed by volunteers, based on the commonly used 'input method' (see below for details of the methods). Of the two variations of the input method used here, the task specific input method were preferred and constitute the major findings of this report. In addition to time volunteered, active SES volunteers contribute considerable amounts of 'stand-by' time. The value of 'stand-by' time was determined through comparison to another study.

Major findings: Value of the SES
This study shows that the SES in NSW and Victoria provide outstanding value for money, and provides a strong argument for enhanced support. For every dollar spent by governments, the SES contributes between $1.30 and $3.73 to the community.

This excellent return on investment is improving continually as the work of SES volunteers expands steadily in terms both of time commitment and variety of tasks.

An active SES volunteer is worth approximately $13,000 per year to the community based on the 'task-specific input' valuing method developed for this study.

The study found that the amount of time volunteers commit is much greater than shown in official data. This is largely because this study documents travel, administration, catering, maintenance and training time, in addition to time spent on response activities and community education. The period during which empirical information was collected was described by many of the respondents described as generally 'quiet' (i.e. not busy).

Additional findings:
Overall, each active member volunteered an average of 3.92 hours per week to the SES. Each active member contributed an average of 4.1 hours per week in NSW and 3.3 hours per week in Victoria over the winter survey period. This can be taken as a minimum as no major operation occurred in either state during this time. In the summer survey (NSW SES units only) each member contributed an average of 3.3 hours per week. Again, during the summer survey period no operations of note occurred.

Time use
The time spent actually carrying out an SES activity (e.g. response, community education, training, etc) itself is only approximately 81 per cent of the total time required for an activity. Time requirements for travel (10%), administration (7%) and catering (2%) make up the remaining time.

Support from outside the SES
The groups that provided support to the SES units during the survey period included individual community members who were not SES members; friends, family and employers of SES volunteers and the business community. Almost all SES volunteers supplement their SES work contribution with personal expenditures for travel, communication, clothing and food. It was noted that individuals who were not SES members provided a substantial amount of communications support to SES units.

The employers of SES volunteers contribute indirectly to the value of the SES by bearing costs due to lost productivity and therefore lost profits when volunteers leave paid work to attend SES operations or do SES activities at work, such as administration. During the survey period volunteers employers incurred costs for vehicles and fuel, loan of equipment, use of fax and internet facilities, use of mobile and office phones and photocopying. Employers of volunteers may also pay volunteers while they are on SES response activities.

Families of SES volunteers provided catering for the SES, and undertook extra domestic responsibilities and costs when SES volunteers were active. Such responsibilities included tasks like child minding and laundering.