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ALLOCATION OF OVERHEAD EXPENSES FOR MAFTECH SOUTH

by

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A project report submitted in partial fulfilment of the degree of Master of Business Administration at the University of Otago, NZ.
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1. INTRODUCTION

1.1. OBJECTIVES

(1) To present the principles one should consider in making allocations of overhead expenses.

(2) To examine the current nature of overhead expenses in MAFTech South.

(3) To recommend the allocation of overhead expenses to science and consultancy sectors.

(4) To recommend regional policy on future treatment of overhead expenses.

1.2. BACKGROUND

MAFTech is one of four national components of the Ministry of Agriculture and Fisheries. It contains what was the MAF Advisory Services Division and Agricultural Research Division. MAFTech South is one of four regions of MAFTech.

The Ministry of Agriculture and Fisheries has, until recently, been a fully funded government department.

Since 1985, MAFTech has had to adapt to a "net funding" policy. The implication of this is that where scientific activities result in benefits to the private sector, the costs of producing these benefits are expected to be met by the private sector. Where activities of science produce public benefits, they will be paid for by government. Over five years, government funding is expected to drop from 100%
This change in funding, from a single source to multiple sources, has brought a need for more comprehensive cost information to assist in:

(a) Decision making on resource allocation.
(b) Pricing.
(c) Cost control.

With the need for improved cost measurement and controls, MAFTech South is progressively implementing a new management accounting system. Currently, overhead costs are not allocated to responsibility centres.

1.3. THE OVERHEAD ALLOCATION PROCESS

The process of overhead allocation is as follows:

(a) Choose the cost objectives, i.e. Decide the levels at which "full cost" information is required.
(b) Choose a cost allocation basis, to allocate overhead costs to the cost objectives.
2. EXECUTIVE SUMMARY

This report shows that the overheads of service centres can normally be allocated to profit centres using the "cause and effect" criterion. When this criterion is used, the overheads of a service centre are allocated in proportion to the outputs provided to each user area.

For some overhead allocations this has been impossible. For example, it is felt that the allocation of Library overheads would be best achieved by seeking a formula which places greatest weighting on the classes of occupation which make maximum use of the Library.

For very general services such as Regional Administration, a general spreader common to all profit and service centres has been required. For a variety of reasons explained in the report, total salaries has been recommended as the spreader.

Allocation of overheads within science sectors using multiple criteria would be difficult and costly to institute, and time-consuming to keep up to date.

The suggestion is that allocation within sectors to science programmes be achieved by using total salaries as a spreader. Unfortunately, salaries themselves are not spread to science programmes currently, but two methods which could achieve this have been noted.

The recommended allocation method is the Step Down Method, which gives partial recognition to services rendered to service centres. With a careful choice of the allocation
sequence, it is felt that this method will meet the needs of MAFTech South.

Appendix A of this report is a schedule of the staff who were consulted during the study.
3. GLOSSARY OF TERMS

A cost objective is any activity for which a separate measurement of costs is desired.

A direct cost is a cost that can be identified specifically with a single cost objective in an economically feasible manner.

An overhead or indirect cost is a cost that cannot be identified with a single cost objective in an economically feasible manner.

Cost allocation is the assignment of a cost, or group of costs, to one or more cost objectives.

A cost pool is any grouping of individual costs.

A separable cost is a cost capable of being traced on a cause-and-effect basis to a particular cost objective.

Depreciation is an attempt to match the capital cost of an asset against revenues earned by an asset.

A responsibility centre is an organisational unit headed by a manager responsible for profits, costs or revenues.

A profit centre is a responsibility centre whose manager is responsible for profit.

A service centre is a responsibility centre whose objective is to provide internal services to other organisational units.
The net cost of running a service centre must ultimately be borne by the profit centres. A spreader is often used to apportion the overhead associated with service centres.

A **spreader** is the common measure which determines the proportions of an overhead cost that are allocated to other costs centres.
4. THE PURPOSE OF ALLOCATING OVERHEADS

Allocation of overheads can serve the following purposes:

(a) Economic decision making

Decisions regarding the allocation of resources among alternative activities are assisted where all costs have been allocated to the activities.

(b) Motivation

The criteria used for allocating overheads can encourage or discourage the use of services such as computers, library and marketing. For example, a decision to replace overhead allocation with some means of direct charging can discourage usage of a service.

Since service centre overheads have never been charged out at MAFTech, the use of services has been according to need, without detailed appraisal of the costs and benefits. During the interviews, managers generally expressed satisfaction that the service centres were catering for the intended users. Therefore the proposed cost allocation procedures do not attempt to create incentives for changing the existing patterns of usage.

The efficiency of services can be encouraged or discouraged through the choice of cost allocation criteria. For example, allocating a budgeted cost rather than the actual cost for a service can encourage the provider to keep actual costs lower than the budgeted figure. The recommendations of this report could be implemented using budgeted costs.
rather than actual costs in situations where greater efficiency of service was desired.

(c) Pricing and reimbursement

In the long run, direct and indirect costs must be recovered by MAFTech, from government and commercial customers. Therefore, full allocation of indirect costs is required to establish a "fair" price.

Reimbursement arises where, say, the government has undertaken to fund the actual cost of a given activity. Complete reimbursement implies the incorporation of indirect as well as direct costs.

(d) External reporting

Under generally accepted accounting principles, both direct and indirect costs should be allocated to products.

In the MAFTech South region, purposes (a), (b) and (c) are growing in importance with the change from full government funding to net government funding. In dealing with the commercial environment, sector and area managers need to be reminded that significant indirect costs exist, and that earnings must be adequate to cover some share of those costs.

Those that provide the service must be encouraged to provide their service effectively and efficiently. When users see the costs of services on their reports, they can be motivated to exert pressure on the managers to control those costs.
5. DEFINITION OF COST OBJECTIVES AT MAFTech SOUTH

5.1. RESPONSIBILITY CENTRES

For this study, the responsibility centres of MAFTech have been defined as follows:

**Service Centres**

1. Regional Management
2. Regional Administration
3. Word Processing
4. Development Workshop
5. Marketing Services
6. Audio Visual Unit
7. Staff Training
8. Information Officer
9. Library
10. Agriscan
11. Statistics/Biometrics
12. Support Farms

**Profit Centres**

1. Animal Nutrition Unit (ANU)
2. Animal Production Unit (APU)
3. Plants, Soils and Engineering (PSE)
4. Consultancy Services
5. Soil Fertility Service
6. Policy Services

The profit centres must ultimately bear all overheads including the net costs of running the service centres.
The organisational structure of MAFTech is still undergoing change at the time of this report, especially with respect to the Areas (outside Invermay) and the farms. The following assumptions have been made regarding the future organisation:

(a) It is assumed that Alexandra and Invercargill Area direct costs will in future be coded onto the management accounting system into science, consultancy and support farms accounts.

(b) It is assumed that the Animal Nutrition Unit will exclude the Abbatoir. Current plans are to treat the Abbatoir as a stand-alone commercial operation. The Animal Nutrition Unit will pay for the services of the Abbatoir as required.

(c) It is assumed that the Animal Production Unit will exclude the Invermay and Waiora Farms. All support farms will be treated as service centres.

5.2. COST OBJECTIVES

It is not adequate to treat all of the profit centres defined above as the cost objectives.

The three science profit centres (PSE, ANU and APU) must be further split into science programmes, as research will in future be planned, coordinated and funded on this basis. The General Ledger will recognise costs to the level of science programme, therefore it is proposed that overheads should be applied at this level.
It is proposed to leave Consultancy Services, Soil Fertility Service and Policy Services as cost objectives.

The Soils Fertility Service (SFS) is part of a national group. It makes use of some significant ongoing services from which it could receive cost allocations; these services being MAFCorp, Regional Management, Regional Administration, Word Processing and Library. Computing costs for SFS are separable and it is recommended that they be directly charged. Occasional work carried out for SFS by other service centres should also be directly charged.

Policy Services is a very small part of a national group. It is assumed that services to Policy Services will be billed by Regional Administration or the service centre concerned - i.e. the net overheads for allocation will exclude services to Policy.

This study considers allocations in two stages. The first stage is the allocation of support centre overheads to profit centres. The second stage is the allocation of overheads within the science profit centres to the science programmes.
6. THE BASIS OF OVERHEAD ALLOCATIONS

6.1. ALLOCATION CRITERIA

Overheads may be allocated on one of the following criteria:

(a) Cause and Effect

This criterion measures the total outputs of the service centre, and allocates costs according to the proportion of the outputs provided to each user. This concept is based on the "user pays" principle.

This may be applied, for example, to Word Processing. Typists provide a standard service to well-defined user groups. Individual typists tend to specialise sufficiently to enable cost allocation according to the split of duties.

i.e. This criterion is most suitable where outputs of a service are homogeneous.

(b) Benefits received

This criterion identifies the beneficiaries of the output of a cost pool and allocates the costs in proportion to the benefits received.

This criterion can be used when allocating advertising and promotion costs. These costs are often allocated on the basis of divisional sales, in the belief that higher sales reflect greater marketing effectiveness.
i.e. This criterion is most suitable where outputs of a service are heterogeneous, but where benefits to each user can be approximately quantified.

(c) Fairness

The need to allocate according to perceived fairness could be illustrated by the case of the Library.

Cause and effect relationships are impossible to trace because relatively few tasks are undertaken for specific users. It is impossible to quantify the benefits a scientist derives from the library and compare them with the benefits derived by another professional.

Where a service such as the Library provides a different range and level of services for different classes of user, one can only hope to allocate costs in a way which the users find equitable.

i.e. This criterion is most suitable where outputs of a service are heterogeneous and benefits to each user can not be quantified.

(d) Ability to bear

This criterion allocates according to the cost objective’s ability to absorb overheads. For example, an allocation of overhead in proportion to the total cost of each cost objective assumes that projects with the highest direct costs can carry the greatest overhead. Allocation on contribution earned assumes that the most profitable projects can absorb the greatest overhead.
This criterion is not generally recommended because it is a pragmatic rather than a logical solution. However, it can be used "when all else fails".

As all allocations are to some extent subjective and approximate, the accuracy of allocations goes no further than the nearest percentage point or $1000.

6.2. USE OF SPREADERS

Where overhead cost items cannot be directly assigned to cost objectives, the use of a reasonable allocation basis (or spreader) is required. The following options were considered for MAFTech.

Physical measures

When approximating cause-and-effect relationships, a physical attribute of users of a service can sometimes be used. These measures have the advantage of being unambiguous and inexpensive to use. The information required is generally required for other purposes anyway.

e.g. Rent can be allocated on the basis of floor area. Cafeteria costs and personnel costs can be allocated on the basis of number of staff.

Relative Cost

One approach that attempts to allocate common costs in proportion to a user's "ability to bear" is allocation on the basis of other costs incurred by users. For example, corporate administration costs may be allocated to the
profit centres in proportion to the total separable costs of each profit centre.

The main disadvantage is that total cost may poorly reflect usage of a service, and it may cause some to feel unfairly burdened. A second disadvantage is that it can be difficult to define and compile total cost figures which put all users on a truly consistent basis, and arguments can develop regarding which costs should be included or excluded from the analysis. (For example, at MAFTech Invermay, you may get disagreement on whether to include or exclude depreciation, farm costs etc.)

**Labour Cost**

A specified cost, common to all cost objectives, is often used as a spreader. Labour cost is an obvious cost to use in this way.

This approach is obviously reasonable where the overhead varies directly with labour cost. e.g. superannuation, ACC levies.

The approach is also suitable if labour costs are the major proportion of total direct costs, and if the amount spent on labour reflects the level of activity of a profit centre.

**6.3. ALLOCATION AT MAFTECH**

**6.3.1 Allocation Between Science and Consultancy**

The greatest difficulty in the allocation of overheads at MAFTech is to strike the correct ratio between the two large businesses of science and consultancy.
The preference in this analysis has been to find a proportional split between science and consultancy which recognises cause and effect.

Where a cause and effect criterion cannot be quantified, there are problems in trying to allocate costs in terms of benefits received or ability to bear. The contrasting natures of research and commercial activities make a meaningful comparison of benefits impossible. The criterion of "ability to bear" is also hard to apply, because of the great changes taking place in the funding of science and consultancy. The only remaining alternative is to rely on a method which is perceived as equitable, that is the least disruptive to the users concerned.

6.3.2 Allocation Among Science Sectors

Because scientists are receiving a similar level and type of service from most overhead sources, it is possible to equitably spread costs among PSE, ANU and APU on a common measure of activity. An attempt has been made to find a spreader acceptable to the science sector managers.

The following measures of activity were initially suggested:

- Number of scientists (A. Sinclair, PSE)
- Total salaries (K. Drew, ANU)
- Total direct costs (G. Davis, APU)

The use of total salaries as a spreader would have some advantages at Invermay:
(a) The output of each sector is largely dependent on the availability and deployment of staff with appropriate skills.

(b) Labour costs are the major proportion of total direct costs.

(c) The relativities of labour costs among sectors should remain fairly stable over time. Therefore, allocations based on labour cost should also be fairly stable.

(d) A genuine relationship exists with respect to some costs. e.g. superannuation, ACC levies.

(e) Allocation using salaries of staff puts a higher weighting on qualified and managerial staff, and this is appropriate for certain technical services. e.g. Statistics/Biometrics, Computing, Library.

(f) Allocation by total salary costs may be used as a reasonable proxy for allocation by the number of staff, especially if the cost to be allocated is relatively small. Labour cost is a more convenient spreader than number of staff, because it is already known in the General Ledger system.

(g) While the management accounting system is going through developments and change, it may be safer and simpler to spread on the basis of easily verified salary figures than to use total costs which have more scope for errors and omissions.

In summary, where cause and effect relationships are too difficult or too costly to measure, allocation by labour
cost is a method which should meet the objective of fairness in the MAFTech situation.

6.3.3 Allocation within Science Sectors

The management and funding of science are undergoing changes in the forthcoming financial year. While science will continue to be managed in three sectors at a local level, about 100 science programmes within the sectors will be managed by eighteen science area leaders on a national basis. Funding of science will be by science programme. This means that the General Ledger system will be required to give analyses by science programme in the future.

The sectors of Plants Soils and Engineering, Animal Production Unit and Animal Nutrition Unit do little cost analysis by science programme at this stage. The monthly cost statements do show most direct cost categories by science programme but the salaries are not allocated to science programmes, except in a few special circumstances, e.g. Waste technology salaries are identified because there is a desire to analyze Waste Technology as an independent unit.

In the case of the Animal Production Unit, I was advised that the allocation of staff to science programmes changes rarely. G. Davis (APU Sector Manager) thought it would be possible to decide salary allocations by science programme fairly accurately. Reviews would be required annually.

A. Sinclair (PSE Sector Manager) has prepared this type of analysis for his own national science area, so he believes that predetermined salary allocations by science programme should be generally available.
If the proportions of sector salaries which should be allocated to science programmes could be predetermined, salary costs could be automatically allocated to those programmes on the UGEN General Ledger system, using the UGEN cost allocation procedures.

A more thorough and dynamic method of allocating salary costs could be available later this year. In December 1989, MAFTech South plans to implement a computer package called Resource Management Module, which will interface with the UGEN General Ledger System and the PIPS payroll system. The Resource Management Module will record the allocation of people's time to science projects. It is intended that the information contained by RMM will be used to make salary allocations to science programmes. The system is currently being tested by another MAFTech region, so little detail is known as yet.

The spreading of all other overheads within science sectors is best achieved by using a measure of activity for each science programme. Total salaries is the suggested spreader.

Therefore, once a method for allocating salaries across science programmes has been decided, it is suggested that all sector overheads be allocated on the same basis. It is felt that any attempt to develop complex allocation rules would be a costly and difficult exercise. Allocation by total salaries would be a fair way to spread costs across programmes where similar types of work are being performed, using similar services.
In summary, salary costs are such a high proportion of total costs that it is clear that automatic allocation of overheads by science programme will be possible only to the extent that the salaries are also allocated.

Automatic allocation of salaries can be achieved either through proportional allocation by sector managers whenever a review is seen as necessary, or through an interface to the Resource Management Module.

Apportionment of overheads within science sectors using total salaries as a spreader would be a reasonable and simple method which would be seen as equitable by the science sector managers.
7. OVERHEADS AT MAFTECH SOUTH

7.1. REGIONAL MANAGEMENT

Regional Management consists of the Regional Manager, Assistant Regional Manager and the Executive Secretary, plus the costs associated with their work. It is felt that their responsibilities are sufficiently general to suggest that the cost of Regional Management should be spread across all other sectors on the basis of total salaries.

7.2. REGIONAL ADMINISTRATION

When considering Regional Administration costs, 1988/89 budget figures have been used to illustrate the method.

Inspection of the 1988/89 budget shows expenditure items which do not relate solely to work activities of the Regional Administration staff. These should be allocated first.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC levy</td>
<td>120,000</td>
</tr>
<tr>
<td>Superannuation</td>
<td>160,000</td>
</tr>
<tr>
<td>Transfer Expenses</td>
<td>25,000</td>
</tr>
<tr>
<td>Fringe benefits</td>
<td>6,000</td>
</tr>
<tr>
<td>R&amp;M</td>
<td>24,000</td>
</tr>
</tbody>
</table>

---------
335,000

These overheads could be allocated by total salaries, since the two major items are directly related to salaries.
Regional Administration staff activities fall into four categories:

**Workload (persons)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>2</td>
</tr>
<tr>
<td>General Admin.</td>
<td>2</td>
</tr>
<tr>
<td>Debtors</td>
<td>2</td>
</tr>
<tr>
<td>Creditors</td>
<td>2</td>
</tr>
</tbody>
</table>

Debtors: 2 (1.5 for consultants, .5 for scientists)
Creditors: 2 (.2 for consultants, 1.8 for scientists)

Total staff 8 (Source: J. Clark)

Personnel and General Administration costs probably relate closely to the number of people, but spreading on salaries, for standardisation and simplicity, would be a reasonable approximation. It is recommended that debtors and creditors be charged to the users identified above, and that all other costs be spread on the basis of total salaries.

Regional Administration staff-related costs in the 1988/89 budget are:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>224,400</td>
</tr>
<tr>
<td>Travel</td>
<td>9,000</td>
</tr>
<tr>
<td>Telephone/Toll</td>
<td>24,000</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>12,600</td>
</tr>
<tr>
<td>Printing/Stationery</td>
<td>12,000</td>
</tr>
<tr>
<td>Other</td>
<td>6,000</td>
</tr>
<tr>
<td>Training/conference</td>
<td>2,400</td>
</tr>
</tbody>
</table>

-------------------------------
290,400
Since half of the staff is involved in Personnel and General Administration, allocate half of the staff-related costs to them. The other half represents debtors and creditors. This cost could be split in the ratio 2.3 : 1.7 to reflect the workloads attributable to science and consultancy.

The allocation of 1988/89 costs would then read:

<table>
<thead>
<tr>
<th>Spread on Salaries</th>
<th>To Consultants</th>
<th>To Science</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-staff: * 335,000</td>
<td>84,000</td>
<td>251,000</td>
<td>335,000</td>
</tr>
</tbody>
</table>

Staff:

Personnel * 145,000
& General

Debtors & Creditors

| * In these sample calculations, it is assumed that total consultants' salaries are approximately one-third of total scientists' salaries. | 480,000 | 181,000 | 444,000 | 625,000 |
7.3. WORD PROCESSING

It is possible to allocate Word Processing costs on the criterion of cause and effect. The costs are approximately separable, to the following extent:

<table>
<thead>
<tr>
<th>User Centre</th>
<th>Workload (typists)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants, Soils and Engineering</td>
<td>1.75</td>
<td>30%</td>
</tr>
<tr>
<td>Soil Fertility Service</td>
<td>.25</td>
<td>4%</td>
</tr>
<tr>
<td>Animal Nutrition Unit</td>
<td>1.25</td>
<td>21%</td>
</tr>
<tr>
<td>Animal Production Unit</td>
<td>.50</td>
<td>8%</td>
</tr>
<tr>
<td>Consultancy Services</td>
<td>1.00</td>
<td>17%</td>
</tr>
<tr>
<td>Marketing</td>
<td>.50</td>
<td>8%</td>
</tr>
<tr>
<td>Library</td>
<td>.25</td>
<td>4%</td>
</tr>
<tr>
<td>Regional Administration</td>
<td>.50</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6.00</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

(Source: D. Parsons)

7.4. DEVELOPMENT WORKSHOP

F. North is the sole person working in the Development Workshop. Work is carried out mainly for scientists, but occasional work has also been done for other areas. Since the farm workshop was wound up, some farm maintenance work has also been referred to the Development Workshop. The workload is approximately 60% development and 40% maintenance.
Plants, Soils and Engineering are reported to be the largest user sector, with Animal Nutrition Unit and Animal Production Unit the only other significant regular users.

Since the Development Workshop exists to provide support to science staff, it is recommended that the net cost of the Development Workshop be spread on total salaries of the three science sectors. Any significant work carried out for other users should be charged.

7.5. MARKETING SERVICES

Currently, Marketing provides a wide range of internal services to science and consultancy sectors.

It also has a budget to enable certain advertising and promotional material to be produced by outside companies.

The decision to use external companies may be prompted by a number of considerations:

(a) Limited capacity of the Audio Visual Unit.

(b) The wish to produce material which the Audio Visual Unit is not equipped to produce.

(c) The wish to produce material which is a "fresh approach" to a subject.

There would be a temptation to directly charge advertising and promotion external costs to the relevant consultancy or science sector. B. Ramsay (Marketing Manager) is concerned that this might pass the control of this expenditure to the consultants and scientists - whereas he would rather
continue to control this expenditure within an approved budget.

I would support Mr Ramsay's belief that the Marketing Manager is the best-qualified person to choose the marketing media.

Since a decision to use external companies instead of the Audio Visual Unit is made by the Marketing manager, it seems logical to continue to treat external advertising and promotion costs in the same way as the Audio Visual Unit — as a Marketing overhead.

B. Ramsay provided the following estimates of expected usage:

<table>
<thead>
<tr>
<th></th>
<th>Science</th>
<th>Consultancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising (YTD actual) &amp; Promotion</td>
<td>78%</td>
<td>22%</td>
</tr>
<tr>
<td>Other Marketing Expenditure</td>
<td>35%</td>
<td>65%</td>
</tr>
</tbody>
</table>

7.6. AUDIO VISUAL UNIT

The Audio Visual Unit primarily serves science sectors, but it also produces work for consultancy. B. Ramsay is currently surveying usage of the Audio Visual Unit, but results are not yet available.

As an interim measure, it is recommended that the costs be apportioned 80% to scientists and 20% to consultants.
7.7. STAFF TRAINING

It is current policy to charge the cost of all manuals, courses, trainers, etc. directly to the sector requiring the services, and this remains unchanged by the suggestion below.

The Staff Training overhead to be allocated is the portion of H. Jagger's time which is taken on staff training coordination. He is currently spending about 15% of his time on staff training, and this percentage may fall to 10% in the longer term.

It is recommended that the small net cost of training be allocated to sectors on the basis of total salaries. Although training is offered to everyone, it seem reasonable to assume that those on the highest salaries are likely to require a wider range of non-technical training opportunities. The proposed weighting will recognise this assumption.

7.8. INFORMATION OFFICER

The main workload of the Information Officer is split as follows:

50 %  Information for MAFTech South generally.
50 %  Work on CAMIS - a scientific project database

CAMIS is actually a national database, paid for at a MAFTech Head Office level. While CAMIS is available to consultants, they make very little use of it. It really exists for the coordination, communication and control of scientific work,
and as such, it is believed that the costs should be allocated to science sectors.

The other Information Officer function could be seen as an overhead to the region, as his services are used to some extent by every employee of MAFTech South. Total salaries would be a reasonable basis on which to allocate this cost.

7.9. LIBRARY

The Library is a "MAFSouth" facility, available to serve all MAFTech, MAFQual and MAFCorp staff in the South Region.

The above MAF businesses were analyzed in terms of "potential users" in a memorandum from J. Winter (Regional Librarian) to Dr K. Steele (Regional Manager) dated 19 May 1987. Potential users were defined as follows:

MAFTech All staff, excluding administration and farm staff.
MAFQual All staff, excluding administration and meat inspectors.
MAFCorp Seven potential users.

It would be tempting to use a similar basis for allocation of costs within MAFTech. With the Interloan service being included as part of the Overhead allocated, the library service represents a wealth of literature on agricultural and non-agricultural subjects. However, it is impossible to measure the allocation of library services in terms of "cause and effect" or "benefits received".

The problem is that certain categories of user do require different levels of service.
Scientists and technical officers rely on the library for research and information. Journals purchased and circulated tend to be mainly for scientists. Consultants do not rely on the library to the same extent, but they do request information from librarians which they have seen summarised on Agriscan.

Because these different levels of service cannot be measured, it is necessary to come up with a formula which library users see as fair. The method suggested in this report is to treat scientists and technical officers as full library users, and consultants as 0.5 users. Technicians, field officers, wage workers, etc have been assumed to be non-users of the Library. This produces the following allocation:

<table>
<thead>
<tr>
<th>Scientists</th>
<th>Technical Officers</th>
<th>Consultants</th>
<th>Users</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSE</td>
<td>17</td>
<td>15</td>
<td>32</td>
<td>45%</td>
</tr>
<tr>
<td>ANU</td>
<td>9</td>
<td>6</td>
<td>15</td>
<td>20%</td>
</tr>
<tr>
<td>APU</td>
<td>5</td>
<td>6</td>
<td>11</td>
<td>15%</td>
</tr>
<tr>
<td>Consultants</td>
<td></td>
<td>29</td>
<td>14.5</td>
<td>20%</td>
</tr>
</tbody>
</table>

(Source: N. McCulloch, salaries clerk)

7.10. AGRISCAN

Agriscan is a database of agricultural and horticultural literature. Accessions lists and abstracts are circulated to scientists and consultants, among others.

Considerable revenue for Agriscan is generated by users outside MAFTech South. It is recommended that the remaining
net cost be distributed in the same proportions as the Library, as Agriscan is really another library service.

7.11. STATISTICS/BIOMETRICS

The Stats/Biometrics Cost Centre provides services in Statistics and Computing. Since the two services involve different staff and different services, it is recommended that the allocation of costs be considered separately.

7.11.1 Statistics

Direct Statistics Costs are the costs of the staff. At present this amounts to 50% of the salaries bill for the cost centre. (Source: P. Johnstone, Scientific Resources Manager) Since the work of Statistics is invariably for science, and since all science sectors should rely on the service to much the same extent, it is recommended that total salaries of PSE, APU and ANU be the basis on which this cost is allocated.

The usage of computing resources by Statisticians is invariably for the benefit of science. The cost of this usage has been included in the allocation of Computing Costs.

7.11.2 Computing Costs

Computing Costs are defined as the total Stats/Biometrics costs, less the salaries of the Statisticians. Computing costs include machine operating and staff costs.

From a study of staff and machine utilisation, P. Lindsay (Computer Systems Manager) produced the following
(1) Allocate one salary to consultants directly.

(2) Allocate the balance of the net cost as follows:

<table>
<thead>
<tr>
<th>Service</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants, Soils and Engineering</td>
<td>25%</td>
</tr>
<tr>
<td>Animal Production Unit</td>
<td>25%</td>
</tr>
<tr>
<td>Animal Nutrition Unit</td>
<td>30%</td>
</tr>
<tr>
<td>Consultancy Services</td>
<td>5%</td>
</tr>
<tr>
<td>Administration and minor users</td>
<td>15%</td>
</tr>
</tbody>
</table>

N.B. The Soils Fertility Service is already treated as an external customer, so it does not require an allocation.

It should be noted that a major computing cost is currently omitted from the chart of accounts - this being the costs of the computer equipment. The Fixed Assets register currently shows the purchase price of equipment as $746,000.
(Source: K. Thomson, Management Support Officer)

MAFTech South currently depreciate such equipment over five years. This means that additional costs of some $150,000 per annum should be allocated - lifting the net cost of computing from $150,000 per annum to $300,000 per annum.

Much of the equipment can be directly linked to user groups. For example, the Soil Fertility Service has exclusive use of one MicroVAX computer. Allocation of depreciation could be achieved by matching machines with users as far as possible, and then allocating the balance according to percentages calculated by P. Lindsay (above).
7.12. SUPPORT FARMS

The funding of the MAFTech support farms is shortly to undergo a policy change nationally. In future, the net cost of running farms will be met by research.

The net cost of each farm is to be allocated according to the relative proportions of research stock employed by each sector.

This seems to produce a reasonable allocation for the Invermay farm, 90% of which is used for research. However, some farms such as Tara Hills use as little as 30% of capacity for research. In such cases, the allocation of net cost among science sectors based on proportions of research livestock may not correctly link causes with effects.
8. **OVERHEADS AT MAFCORP SOUTH**

8.1. **INVERMAY HEADQUARTERS**

It is proposed that the Total Serviced lease of the main Invermay building be allocated on the basis of floor areas. It is suggested that the total lease be allocated among all service and profit centres according to the proportion of usable office space occupied.

This approach has already been adopted by M. Currie at MAF Head Office. (He uses a Statistical File on the UGEN General Ledger Package to record the usage of the Head Office building by MAF businesses, so that changes in the utilisation of the building can be quickly recognised by the accounting system).

Electricity, Conference Centre, Staff Transport, Cafeteria, Mail/Filing, Reception and Telecom costs could be allocated to all profit and service centres on the basis of salaries of Invermay-based staff.

8.2. **RECEPTION CENTRE**

Since reception services are for all staff, allocation by total salaries is appropriate. The salaries of staff based outside the Invermay campus should be excluded.

8.3. **APU and ANU**

These leases are itemised and can be charged directly. Note that the ANU figure currently includes the Abbatoir, which should be separately identified and charged in the future.
8.4. INVERMAY GENERAL

This figure consists of a number of facilities which can be directly charged. e.g. Invermay farm and buildings can be charged to farm accounts, quarantine unit to APU, glasshouses to PSE.

8.5. FARM LEASES

Woodlands, Tara Hills. Waiora and Redbank leases can all be charged against the respective farm accounts.

8.6. AREA COSTS

Leases of commercial buildings outside Invermay could be allocated among consultancy and science sectors according to the proportions of usable space occupied. Most of these leases are for consultancy, but Alexandra and Invercargill accommodate science as well.
9. OVERHEADS AT MAFTech HEAD OFFICE

A memorandum dated 8 December 1988, from WJ Orsman (Group Accountant, MAFTech), states that MAFTech's share of Head Office costs is $578,000.

MAFTech Head Office management exists to support all MAFTech personnel. Therefore, it is suggested that this cost be spread across all MAFTech South service and profit centres on the basis of total salaries.
A memorandum dated 8 December 1988, from WJ Orsman (Group Accountant, MAFTech) gave the following information regarding MAFCorp Head Office overheads allocated to MAFTech South:

<table>
<thead>
<tr>
<th>Category</th>
<th>$000's</th>
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<tbody>
<tr>
<td>Legal</td>
<td>13</td>
</tr>
<tr>
<td>Accounting and Finance</td>
<td>408</td>
</tr>
<tr>
<td>Personnel</td>
<td>200</td>
</tr>
<tr>
<td>Corporate Communication</td>
<td>101</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>155</td>
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<tr>
<td>Business Support</td>
<td>70</td>
</tr>
<tr>
<td>Capital usage</td>
<td>50</td>
</tr>
<tr>
<td>Non MAF voted cost</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,018</strong></td>
</tr>
</tbody>
</table>

Corporate management exists to support all MAFTech personnel. Therefore, it is suggested that this cost be spread across all MAFTech South service and profit centres on the basis of total salaries.
11. IMPLEMENTATION CONSIDERATIONS AT MAFTECH SOUTH

11.1. CAPABILITY OF MAFTECH ACCOUNTING SOFTWARE

The allocation of overheads is to be achieved at MAFTech South through the UGEN General Ledger Package.

UGEN can allocate costs in three ways:

(a) Fixed amounts can be allocated as a recurring journal entry.

(b) Fixed percentages of an account balance may be allocated.

(c) Allocations may be made in proportion to the balances held in a third group of accounts. (This provides for dynamic use of a spreader)

It is most common for overheads to be applied at predetermined rates, with overhead recovery accounts credited with equivalent amounts. UGEN provides the flexibility to achieve this.

Appendix B is an extract from the UGEN manual, which documents the package's allocation options in greater detail.

11.2. AVAILABLE METHODS

Allocation methods commonly used are the Direct Method, the Step Down Method and the Reciprocal Method. UGEN does not
offer the Reciprocal Method.

The Direct Method makes no attempt to account for services provided by service centres to other service centres, i.e. All service centre costs are apportioned to a separate group of profit centres.

The Step Down Method allows limited recognition of services rendered by service centres to other service centres. The sequence in which allocations are made is critical. The sequence often begins with the centre that renders the highest percentage of its total services to other service centres. Once a service centre's costs have been allocated, no subsequent service centre costs are reallocated back to it. Allocations continue until all costs are allocated to profit centres.

The Two Step Direct Method is a compromise which firstly allocates all service centre costs to either profit centres or service centres. In the second step, costs allocated to service centres in the first step are reallocated to profit centres.

In terms of simplicity - ease of understanding, implementation, amendment and verification - the direct method would be best. For a little more sophistication, the step-down method would also be quite straightforward.

The Two Step Method appears feasible in UGEN, and it would be worth considering if service centres provided a significant amount of reciprocal services, and if an attempt was being made to evaluate the overhead associated with running the service centres.
11.3. RECOMMENDED IMPLEMENTATION

I feel that use of the Step Down Method would be an adequate way of spreading overheads. As stated earlier, the sequence of allocation is critical using this method, as allocations can only be from the top down. (i.e. Reciprocal services can not be recognised.) While there is no "correct" way to establish a sequence of allocations, the following is suggested.

(a) Allocate service centres which receive no overhead charges from MAFTech:

MAF Head Office
MAFTech Head Office
MAFCorp South

(b) Allocate service centres which provide significant support to Regional Management and Administration:

Word Processing
Statistics/Biometrics

(c) Allocate service centres whose costs could be seen as an extension of Regional Management:

Information Officer
Staff Training

(d) Allocate regional overheads:

Regional Administration
Regional Management
(e) Allocate services to science and consultancy:

Marketing Services
Audio Visual Unit
Development Workshop
Library
Agriscan
Support Farms

(f) Allocate overheads within science sectors to science programmes using total salaries as a spreader.
APPENDIX A: INTERVIEW SCHEDULE

Acting Regional Manager : Mr. B. Parker

Science Sector Managers :

Plants, Soils and Engineering : Dr A. Sinclair
Animal Nutrition Unit : Dr K. Drew
Animal Production Unit : Mr G. Davis

Sector Manager, Scientific Resources : Mr P. Johnstone

Marketing Manager : Mr B. Ramsay

Sector Manager, Management Support : Mr J. Clark

Staff Training Coordinator : Mr H. Jagger

Computer Systems Manager : Mr P. Lindsay

Regional Librarian : Mrs S. Weddell

Information Officer : Mr N. Round-Turner

Supervising Typist : Mrs D. Parsons

Technical Officer, Development Workshop : Mr F. North

MAFCorp FIS Officer : Mr P. Cullen

MAF Head Office : Mr M. Currie
APPENDIX B: ALLOCATION OF COSTS USING "UGEN"

GENERAL LEDGER PACKAGE
ALLOCATIONS

A powerful allocations facility exists in UGEN to enable the system to perform the following types of allocations:

1. Fixed Amount Allocation:

   This type of allocation can be used to post a fixed amount per period, or an annual amount spread over a number of periods on a predetermined basis, as a recurring journal entry. For example, general administration expenses may be charged to operating departments at a rate of $x per month and general administration recoveries is credited with an equivalent amount.

2. Fixed Percent Allocation:

   This commonly used type of allocation operates to allocate the whole, or a percentage of, the "balance" in one account against one or several other accounts in a fixed ratio. The "balance" can be either actual, budget, or revised budget amounts.

3. Proportional Allocation:

   This type of allocation operates to allocate the whole, or a percentage of, the "balance" in one account against one or several accounts in proportion to the balances held in a third group of accounts. An example is the spread of computer costs across user departments according to the statistical computer usage of each department as a proportion of the total computer usage. The expense allocated each period will vary as the amount of computer usage varies.

Journal entries, with narrations provided by the user, are generated for all allocations to provide a full audit trail.
ALLOCATIONS

The allocations facility in UGEN enables the system to automatically calculate and post journal entries to accounts in the ledger on a recurring basis. Allocations may be based on any of the financial information held in account records - i.e. Actual, Budget, Last-year actual, etc.

Examples of allocations that can be performed automatically by the system are -

* Allocation of prepayments or annual amounts over accounting periods
* Allocation of central administration expenses to cost centres
* Allocation of overhead costs to production
* Labour on-cost calculations
* Currency conversion with the retention of conversion differences.

To have the system perform allocations the user enters the allocation "rules" on-line into records held on the Allocations File. Then, normally once per period, the allocations run program (UGEN06) can be executed to use those "rules" to generate journal entries and post them to the accounts specified.

Allocation rules are stored in the Allocation File in groups. Each group of allocations is given a code so that any individual group can be run independently and/or before other groups for the following reasons -

1. Some allocations may allocate amounts into accounts which are then allocated out on a different basis. For example, factory rent must be allocated to factory overhead accounts before overheads are allocated to production centres.

2. Certain allocations may be required to be run every period whereas others are required to be run only once per year on a year-to-date basis.
When program UGEN06 is run to perform allocations, the user specifies which groups are to be run and the sequence in which they are to be run. At the completion of each group of allocations, the journal entries generated for that group are posted before the calculation phase for the next group is commenced.

The information held in the Allocations file for each of the three available allocation types is described briefly hereunder. Full details on the contents of each field are contained in the Terminal Users Guide.

**Fixed Amount Allocation**

- Unit Number
- Group code
- Sequence number
- Type code (1)
- Account number of allocate-to account
- Narration for allocate-to account transactions
- Account number of offset account
- Narration for offset account transactions
- Fixed amount
- Account number and amount set of the account to be used to obtain the spread of a fixed annual amount across accounting periods

**Fixed Percentage Allocation**

- Unit Number
- Group code
- Sequence number
- Type code (2)
- Account number of allocate-to account
- Narration for allocate-to account transactions
- Account number of offset account
- Narration for offset account transactions
- Percentage to be allocated
- Account number and amount set of the account to be used as the basis of the allocation
- Optional rate
Proportional Allocation

Unit Number
Group code
Sequence number
Type code (3)
Account number of allocate-to account
Narration for allocate-to account transactions
Percentage to be allocated
Account number and amount set of the account
to be used as the basis of the allocation
Account number of the dividend account
Account number of the divisor account
(the balance of the dividend account when
divided by the balance of the divisor
account gives the proportion to be allocated)
Dividend/Divisor amount set

Listing the Allocations File

An Allocations Listing (Report No. 9006) can be printed at any
time to provide a hard-copy record of the "rules" held in the
Allocations File.

Allocations Run Report

Whenever program UGEN06 is run to perform allocations, an
Allocations Run Report is produced. When read in conjunction with
the Allocations Listing, this report provides a complete record of
exactly how allocation transaction amounts have been arrived at.

A sample Allocations Run Report and Allocations Listing appears on
the pages that follow.
<table>
<thead>
<tr>
<th>DATE</th>
<th>19/01/83</th>
<th>TIME</th>
<th>18/50</th>
<th>NOTES</th>
</tr>
</thead>
</table>

**DEMONSTRATION UNIT**

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<th>GROUP</th>
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<th>ALLOCATE-TO ACT/</th>
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<th>AMOUNT/</th>
<th>SPREAD/BASE ACT</th>
<th>BASE SET/</th>
<th>RATE</th>
<th>DIVIDEND ACT/</th>
<th>DIV SET</th>
<th>DIVISOR ACT</th>
</tr>
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</table>

**PRINT PARAMETERS**

- **UNIT**: 1
- **REPORT NUMBER**: 9006
- **FROM GROUP**: A
- **TO GROUP**: C
### UGEN GENERAL LEDGER SYSTEM

**ALLOCATIONS LISTING**

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<th>ALLOCATE-TONarrATION/ OFFSET NARRATION</th>
<th>ACT/SPAND/BASE ACT</th>
<th>PERCENT</th>
<th>BASE SET/ RATE</th>
<th>DIVIDEND ACT/ DIV SET</th>
<th>DIVISOR ACT</th>
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<td>ALLOCATE-TO NARRATION/OFFSET NARRATION</td>
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<td>SPREAD/BASE ACT</td>
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<td>ACTUAL</td>
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<td>01 2001G</td>
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DEMONSTRATION UNIT

UGEN GENERAL LEDGER SYSTEM

ALLOCATIONS LISTING

PAGE 3
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<tr>
<th>GAP SEQ TYPE</th>
<th>ALLOCATE-TO ACT/</th>
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<th>AMOUNT/</th>
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END OF REPORT
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POSTINGS DATED 19/01/03 INCLUDED IN BATCH ALLOCA PERIOD 04 600.00

TOTAL FOR BATCH 600.00
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TOTAL FOR BATCH 0.00
### UGEN GENERAL LEDGER SYSTEM
### ALLOCATIONS RUN REPORT

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<td>ALLOC TO DEPT A</td>
<td>1,625.23CR</td>
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<td>C</td>
<td>000020</td>
<td>2</td>
<td>01 2700B</td>
<td>XC000020</td>
<td>ALLOC FROM GENRL DEPT</td>
<td>3,018.27</td>
<td>4,643.50</td>
<td>65.00%</td>
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<td>ALLOC TO DEPT B</td>
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**POSTINGS DATED 19/01/03 INCLUDED IN BATCH ALLOC PERIOD 04**

4,643.50

**TOTAL FOR BATCH**

4,643.50
BIBLIOGRAPHY


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