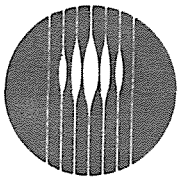


CSIRO Research Priorities 1994-95 to 1996-97

A Progress Report

August 1993

CORPORATE PLANNING OFFICE
CSIRO

CONTENTS

Overview 1
- The Priorities
- The Process

First Triennial Review 1

Second Triennial Review Phases 2

Preparatory Phase 2
- Improving Information and Analysis
- Preparatory Workshops
- Pre-Workshop Scoring
- Role Statement Drafting

Decision Phase 5
- Priorities Workshop
- Progress Report to Board
- Board Decisions

Implementation Phase 8
- Objective and Principles
- Target Profile
- Research Classification
- Development of Research Programs
- Annual Priority Decisions
- Role Statements and Planned Outcomes
- Strategic Plan

Possible Future Developments 14

Box 1: CSIRO Research Purposes 1
Box 2: Priorities Criteria - Key Discriminant Questions 3
Box 3: Extending CSIRO Priority Setting Process 6
Box 4: Pre-Workshop Priorities Scoring 7
Box 5: Return to Australia from R&D, 1990 and 1993 9
Box 6: Receptor-User Linkages 10
Box 7: R&D Capacity - Meeting Human Resource Needs 11
Box 8: Priorities Decisions 1994-95 to 1996-97 12
Box 9: Schedule for Implementation of Research Priorities and Preparation of CSIRO Strategic Plan 1994-95 to 1998-99 15

Overview of Priorities and Process

At its June 1993 meeting the CSIRO Board decided on research priorities recommendations made by the Executive Committee for the budget triennium commencing on 1 July 1994. The Board's decisions on priority research areas are based on a process of rigorous assessment extending over a period of one year and involving Institutes, Divisions and advisory committees. Decisions on priority research programs will be made by the Board in December 1993 following development of proposals by cross-Institute and cross-Division teams.

The Priorities

After weighing up the results of the Executive Committee's deliberations, the Board agreed that minerals, environmental and rural research continue to provide a high return to Australia. However, they also considered that CSIRO research for manufacturing and information and communications industries provide a high return but are not receiving a level of resources commensurate with their importance to Australia. This led to the decision that increased resources will be re-directed to three of CSIRO's major research purposes: Minerals Resources, Manufacturing Industries, and Information and Communications Industries.

The Board also decided that appropriation funding would be maintained at the 1992-93 level for the environmental research purposes : Environmental Aspects of Economic Development, and Environmental Knowledge.

The Process

The Executive Committee Research Priorities Workshop in March 1993 completed a process of appraisal involving Divisions, Institutes, key external shareholders, the Executive Committee and the Board supported by the Corporate Planning Office.

The overall process was a major improvement on the first triennial review of research priorities held in 1990. This was partly due to experiences gained from priorities exercises undertaken by Divisions since 1990.

First Triennial Review

The purpose of CSIRO's triennial review of its research priorities is to redistribute limited resources among competing research opportunities such that maximum benefits are achieved for Australia.

The first review conducted in 1990, to cover the budget triennium 1991-92 to 1993-94, had the following salient features:

- The classification of research purposes by socio-economic objective (SEO), as derived from the Australian Standard Research Classification of the Australian Bureau of Statistics. At that time the classification comprised:
  - four divisions : *Economic Development* and *National Welfare* to which CSIRO directs most of its effort, *Advancement of Knowledge* essentially that associated with the Australia Telescope, and *National Security* to which CSIRO makes a small contribution to research for Defence.
  - 20 SEO sub-divisions, of which 17 are relevant to CSIRO as shown in Box 1.
  - 72 SEO groups and 372 SEO classes relevant to CSIRO.

Box 1: CSIRO's Research Purposes

1. Plant Prod'n & Primary Products
2. Animal Prod'n & Primary Products
3. Rural-based Manufacturing
4. Mineral Resources
5. Energy Resources
6. Energy Supply
7. Manufacturing
8. Information & Communications
9. Environ'l Aspects of Econ. Develop't
10. Environment
11. Transport
12. Construction
13. Commercial Services
14. Health
15. Defence
16. Community Services
17. Advancement of Knowledge

- Adoption of an evaluation framework for assessment of the ***Return to Australia from R&D*** for each research purpose and comprising two components :
  (1) ***Attractiveness*** defined by the product of "scores" for two "priorities criteria", namely
  .. ***Potential Benefits***
  .. ***Australia's Ability to Capture the Benefits***
  (2) ***Feasibility*** given by the product of "scores" for two "priorities criteria", namely
  .. ***R&D Potential***
  .. ***R&D Capacity.***
- Preparation of a "Data Sheet" and an "Evaluation Sheet" for each SEO sub-division to assist scoring. The Data Sheet covers industry and R&D information. The Evaluation Sheet addresses key "discriminant" questions under each of the four criteria. The latest version of these questions are provided in Box 2.
- Scoring the criteria for each sub-division by the members of the CSIRO Executive Committee.
- Presentation of *Return to Australia from R&D* by graphing the *Attractiveness* product score against the *Feasibility* product score for each SEO sub-division.
- Interpretation of the screen in terms of the strength of emphasis and degree of selectivity that are appropriate at a national level for each of the SEO sub-divisions.
- Further consideration and definition of the role and strategies that CSIRO should take in responding to the national assessment, recognising the roles of other research performers.
- Interactive workshop discussion of the evaluations by Executive Committee members together with feedback from line managers and the CSIRO Board to maximise ownership and commitment.

Outputs from this priorities review included:

- A set of national research priorities from a CSIRO perspective.
- Based on the assessment of national research priorities, an agreement was reached on CSIRO's research priorities:
  – strategic research for Mineral Resources and Environmental Aspects of Economic Development were identified as SEO sub-divisions of high priority warranting additional resources.
- A CSIRO Strategic Plan for the five years ending 1995-96.

Details of the priorities methodology and the full SEO class structure at the time of the first review are provided in the report *CSIRO Priority Determination 1990 - Methodology and Results Overview* (1). Details of the results are in various papers and reports (2-5).

Second Triennial Review Phases

Preparations for the second review to cover the triennium 1994-95 to 1996-97 began in early 1992. The *preparatory phase* continued until the Executive Committee Research Priorities Workshop - referred to as the Priorities Workshop in the following - in March 1993. This initiated a *decision phase* which continued until the Board meeting in June 1993. The period July 1993 to June 1994 is referred to as the *implementation phase*.

Preparatory Phase

A concerted effort was made during 1992 to improve on the 1990 information and analyses required for the priorities-based evaluation of the SEO sub-divisions. In the year leading up to the Priorities Workshop several preparatory workshops were conducted. These helped to identify global, national and sectoral challenges which prescribed a strategic context for CSIRO. This ensured that Executive Committee members were well briefed for the activity of determining scores for the SEO sub-divisions according to the four priorities criteria.

Improving Information and Analysis

This involved revisions to the SEO classification at sub-division, group, and class level to provide the basis for data and trends, generally obtained from official statistical sources, concerning:

Box 2: Priorities Criteria - Key Discriminant Questions

Attractiveness Criteria

Potential Benefits

(Maximum economic, environmental and other social returns possible for Australia from technical improvement in the Sub-division)

- Who are the potential users and customers and how will they benefit?
- What parts of the industry/sector and/or the community will benefit from successful research?
- How will R&D contribute to industry growth, improved competitiveness and/or better management of the natural environment?
- What is the size (value) of potential markets in Australia and overseas and what are their growth prospects over the medium to long term?
- Are there other important benefits, direct and indirect environmental (degradation avoided), social (social amenity, health, safety), employment creation?
- Are there spillover benefits to other sectors?

Ability to Capture Benefits

(Ability of Australia's companies, organisations and utilities to convert technical progress into commercial and other returns for Australia)

- What is the sector's and/or community's commitment to technical innovation and R&D - What is the level of R&D intensity in the sector?
- Are there factors and conditions likely to promote or impede technology uptake, such as regulations, industry structure and competitiveness, physical conditions technological, ethical, cultural/social, environmental and/or political factors?
- What are the incentives/imperatives for adoption by commercial and/or public sectors?
- Does Australia have the necessary ability to exploit the research results?
- Are there potential commercial/non-commercial partners?
- Can the benefits from commercial research output be protected?
- Can Australian users compete inter-nationally?

Feasibility Criteria

R&D Potential

(A measure of technical potential of relevant areas of research and development: maturity of the fields, closeness of the technical and physical limits; breakthrough prospects)

- How close are the physical and technical limits in the relevant R&D?
- Are fields mature or developing? (Where is current technology on the S-curve?) i.e., is the rate of change rapid, moderate or slow?
- What are the prospects for developing commercially valuable intellectual property, scientific breakthroughs, enhanced understanding of or major improvements in mature technologies and fields?

R&D Capacity

(A measure of the national research ability, in terms of quality and quantity of resources, to achieve the R&D Potential and technology goals in a timely way)

- Would the proposed research effort (in terms of the quantity and quality of resources - critical mass and quality of researchers) be internationally/nationally competitive in the research field?
- What is Australia's (CSIRO's) competitive advantage in research for this SEO?
- Could the required research services be obtained more efficiently and effectively from overseas?
- Who are major international/national research competitors & collaborators?
- Does Australia/CSIRO have the capacity to deliver the research, in terms of adequate skills, facilities, and time frame for effective application?

- the size of the sub-division: value of production, value of exports and imports, value added, investment characteristics, levels of impact and statistics on natural resources etc.;
- R&D expenditure: nationally, by CSIRO, by the business, government and non-government sectors, and with valid international comparisons where possible;
- key issues affecting national performance and international competitiveness; and
- amenability to R&D.

This external data is combined with SEO-based internal data and trends on human and financial resources to form an SEO system which can be accessed by a computer link to the CSIRO Executive Information System (EIS).

A wide range of social, economic and R&D trends and indicators, generally at a macroscopic level, are compiled from official statistical sources. Medium and long term projections for most SEO sub-divisions and groups are derived from "databases" of economic projections generated and made available on a commercial basis by companies specialising in this type of service.

Use is also made of "key issues briefs". These are prepared in-house, presently covering the reports of over 20 major studies or inquiries initiated by international and national government and industry in the past three years.

The foregoing information and analyses are assembled into the *CSIRO Research Priorities Data Compendium 1993* (6). Also included in the *Compendium* are detailed data and information statements which directly support the preparation of the Data Sheet and Evaluation Sheet for each SEO sub-division.

As noted earlier the Data Sheet covers industry, natural resources, and R&D information and industry analysis: structure, strengths, weaknesses, threats, and opportunities. The Evaluation Sheet focuses on the key discriminant questions for each of the four priorities criteria as shown in Box 2. These are then assembled into a report referred to as the *SEO Sub-division Data and Evaluation Sheets* (7).

The Corporate Planning Office (CPO) keeps the *Compendium* up to date through a quarterly bulletin referred to as ***Plan Link***. Both are provided to all research program and business managers in CSIRO.

Preparatory Workshops

In July 1992 the CSIRO Board held a workshop, assisted by McKinsey & Co., to evaluate its performance since establishment and to identify global and national challenges, particularly those to which CSIRO has a capacity to contribute. Key areas and issues identified included: environmental resource degradation, management of waste products, communications and information technology, genetic engineering, food and nutrition, tourism, population growth, and value-adding and branding. Details are in the Board publication *Science & Innovation* (8) which was sent by the Chairman to the chairmen and chief executives of over 20 major companies and over 20 key Federal and State politicians.

Building on the Board's workshop, the Chief Executive convened a three day Retreat in February 1993, six weeks before the Priorities Workshop. The objective of the first day of the Retreat was to provide the strategic context for determining CSIRO's research priorities for the next five years and beyond. This was to be achieved by integrating the views of external speakers, members of the CSIRO Board, developed prior to and during the Retreat, and members of the CSIRO Executive Committee. The focus was on identifying directions for Australian industry and community development which would influence CSIRO's research opportunities.

A key feature of the opening day was the presentation and discussion of the views of three external speakers. These views related to global challenges and the opportunities and threats these posed for Australia. Suggestions were made or questions posed on the implications of this for CSIRO. The external speakers were: Mr Ralph Evans, Managing Director, Austrade, who considered "Globalisation of Technology: Implications for Australian Business"; Mr Eriks Velins, General Manager, Corporate Planning and Economics, Shell Australia, who spoke about "Shell International's Global View"; and Dr Gus Hooke, Managing Director, Corporate Economics Australia Limited whose topic was

"Australia's Global and Asian Context to 2020." Their addresses are included in the report *Proceedings of the Chief Executive's Retreat* (9).

Given this strategic context, the Executive Committee then focused on research opportunities and directions for each SEO sub-division. Consideration was also given to the outcomes sought from the Priorities Workshop.

The Retreat led to three main outcomes:

- a shared perspective on key issues and challenges facing Australia and related strategic opportunities for research over the next decade and beyond;
- an increased focus on linkages with the receptors and users of CSIRO's research; and
- an increased focus on the strategies for building the skills base to harness these linkages.

The first outcome influenced the final set of key issues briefs provided in the *Compendium* and the content of the Data Sheets and Evaluation Sheets. The linkages between the second and third outcomes and the existing priorities process are depicted in Box 3. This schema provided the driving logic for the final preparations and conduct of the Priorities Workshop.

Another major input to the process at a sectoral level was a major priority setting exercise conducted by the CSIRO Agricultural Sector Advisory Committee. This covered the research of both rural Institutes and the inputs to rural research from other Institutes, particularly the Institute of Natural Resources and Environment. Held in late February this workshop involved many external stakeholders and a CSIRO Board member. Similar sectoral workshops were conducted by other Institutes. The results of these workshops had a strong bearing on the final content of the Data Sheets and Evaluation Sheets.

Pre-Workshop Scoring

Two weeks before the Priorities Workshop Executive Committee members were provided a guide to out-of-session scoring in a booklet referred to as *Individual SEO Sub-division Score Sheets and Scoring Procedures* (10). This document together with the *Compendium* and *SEO Sub-division Data and Evaluation Sheets,* circulated two weeks earlier, assisted Executive Committee members to determine their priorities scores out-of-session. The booklet consisted of a proforma for each SEO sub-division which provided a means of recording a score between 1 and 10 for each of the four priorities criteria and accompanying reasons for these scores. These scores were then transcribed to the Summary Score sheet shown in Box 4, collected by CPO, averaged, plotted, outliers identified, and provided back to Executive Committee members one week prior to the Priorities Workshop. Executive Committee members were then requested to use the scoring proforma to record questions pertaining to outlier scores.

Role Statement Drafting

The SEO sub-division Role Statements are a major product of the CSIRO research priority setting process. Each statement provides a **National Perspective** covering (i) a definition and description of the sub-division, (ii) the rationale for its national priority rating, and (iii) a national R&D context; and a **CSIRO Response** covering (iv) CSIRO's contribution to national R&D, (v) CSIRO's decision on the priority rating, (vi) CSIRO's strategies, and (vii) priority areas of research. Since some of this is covered in the sub-division Data Sheets and Evaluation Sheets, a start is made prior to the Workshop on drafting the Role Statements, notably items (i), (iii), (iv) and to some extent items (vi) and (vii).

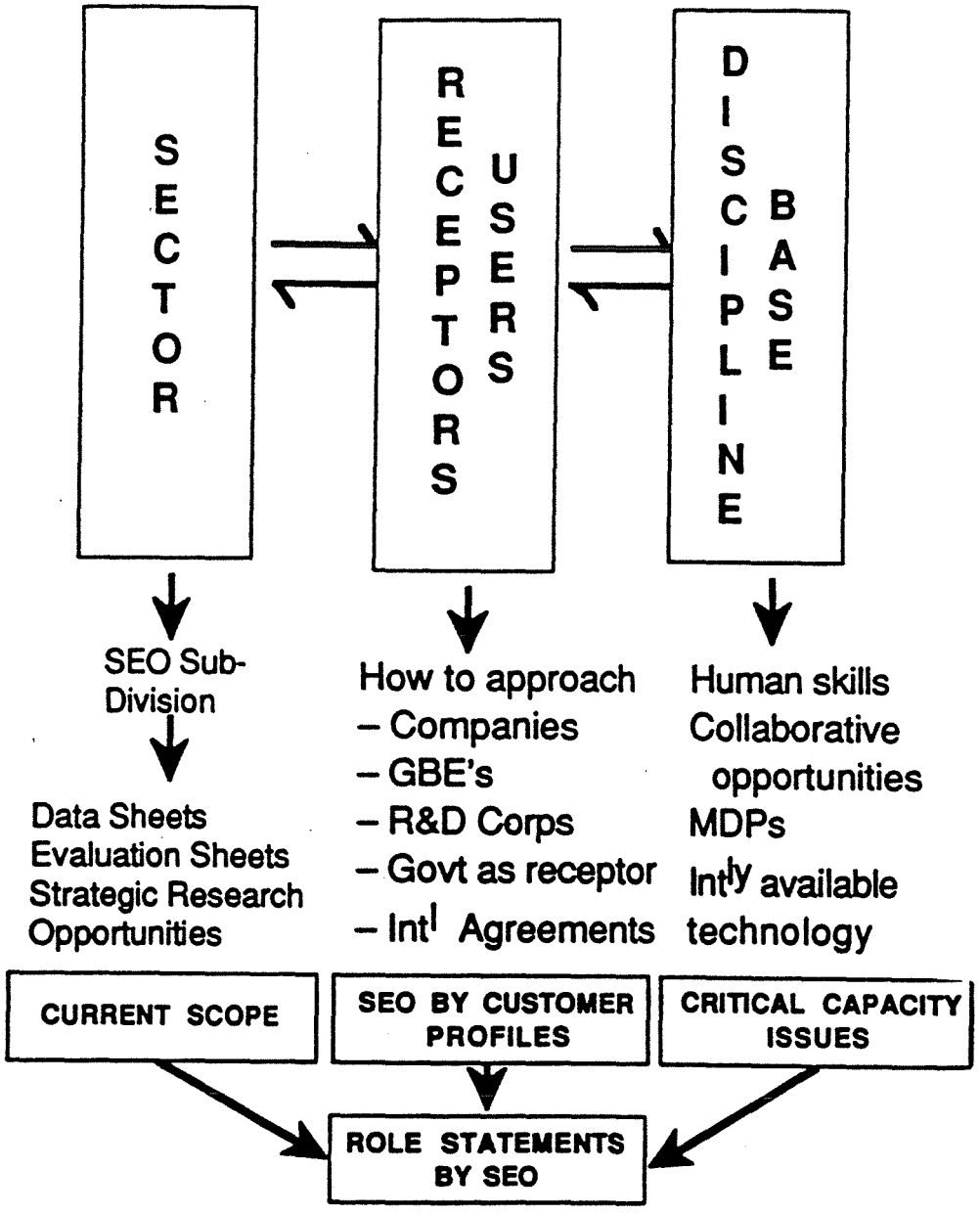
Decision Phase

The decision phase was the culmination of an intensive assessment process which involved the Board and Executive Committee working together to reach rational, convincing decisions on CSIRO's research priorities. It comprised the Priorities Workshop, a progress report to the Board, and decisions by the Board concerning SEO sub-division priorities and funding.

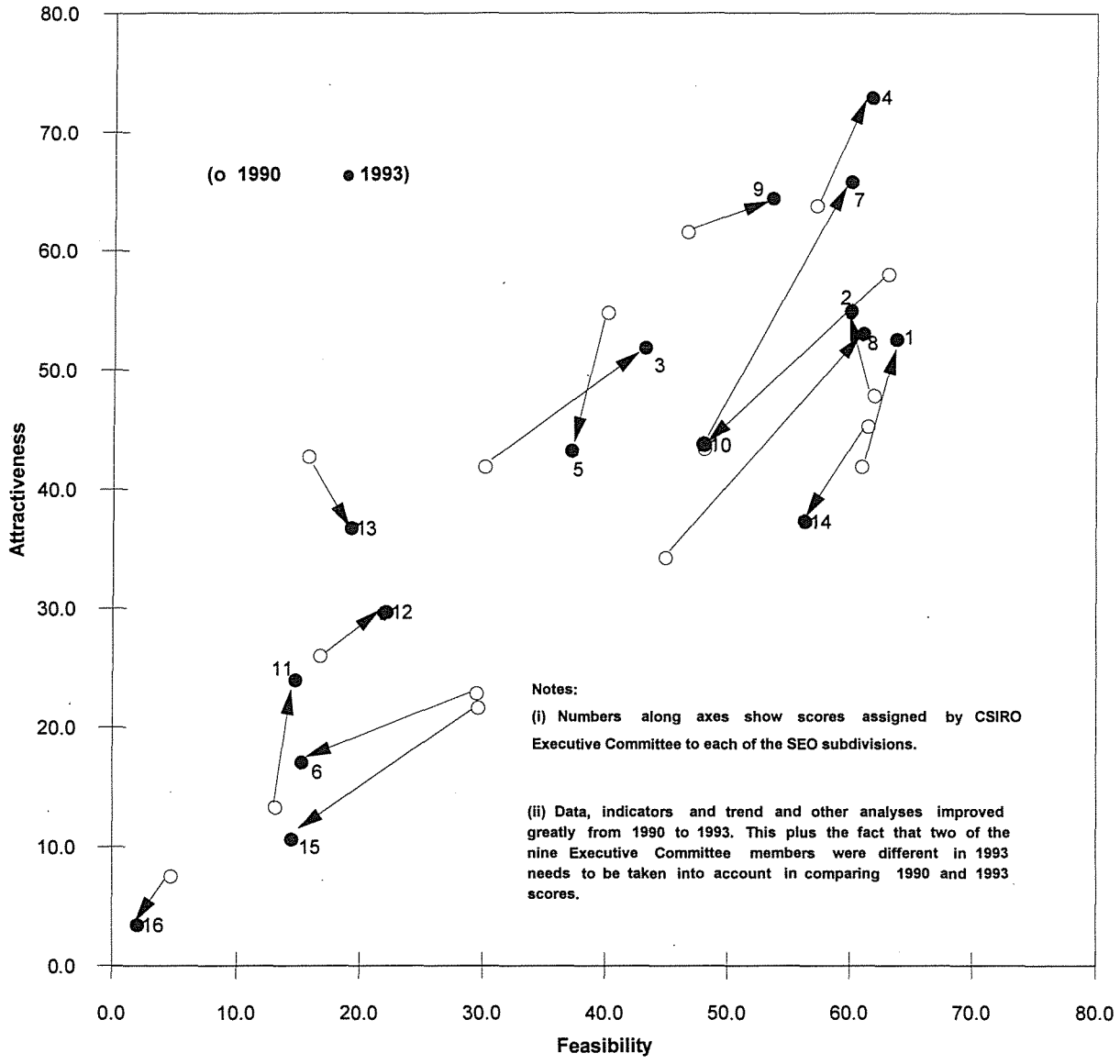
Priorities Workshop

Executive Committee members began the Workshop by reviewing the outlier scores from the pre-Workshop scoring exercise. As well as the pre-recorded reasons and questions for

Box 3: Extending CSIRO Priority Setting Process



Box 5: Return to Australia from R&D, 1990 and 1993



Key to CSIRO's SEO subdivisions:

1 Plant Production and Primary Products
2 Animal Production and Primary Products
3 Rural-Based Manufacturing
4 Mineral Resources
5 Energy Resources
6 Energy Supply
7 Manufacturing
8 Information and Communications
9 Environmental Aspects of Economic Development
10 Environmental Knowledge
11 Transport
12 Construction
13 Commercial Services
14 Health
15 Defence
16 Community Services

Box 6: Receptor-User Linkages

The following is a summary of the key issues raised during presentations and discussion:

- **Our experience** in private sector interactions show that it is profitable to:
  - develop one-on-one relationships with major companies (>$100M pa turnover).*
  - deal through industry associations (e.g. AMIRA) to spread research risk among several companies participating in jointly funded research programs.
  - sponsor professional courses and seminars on recent developments for small companies, consultants and service providers.
- **Our experience** in government and government agency interactions shows the wisdom of:
  - developing joint ownership of research programs amongst CSIRO/funding agency/ultimate user.
  - convening national workshops of users to inform them of our public interest research activities and gain their endorsement.
  - developing advice for Ministers in their policy setting activities.
  - understanding and networking the key receptors in State and Federal departments and Rural Industry Corporations.
- **Our examination** of Australia's future needs and CSIRO's capacity to contribute has identified:
  - the growing importance and impact of multi-Divisional and multi-disciplinary projects and programs in CSIRO.
  - the importance of marketing research capability to State and Federal government agencies.
  - the need to encourage Rural Industry R&D Corporation funding of large research programs.
  - the importance of federal government financial stimulus for small and emerging companies in their quest for growth through innovation.

---

*Footnote: CSIRO is also increasing its interaction with small to medium size enterprises. A major response of the CSIRO sponsored McKinsey Study "Towards Successful Support for Australia's Small and Medium Sized Enterprises", August 1993 is that the "CSIRO research priorities process supports the need to increase significantly the level of interaction with SMEs. CSIRO intends to double the level of its interactions with SMEs over the next 5 years within the constraints of the Organisation's overall budget."

Box 7: R&D Capacity - Meeting Human Resource Needs

An assessment of human resource capacity is a key factor in determining research priorities and developing strategies for enhancing receptor/user linkages.

Assessing long-term needs

- Global trends indicate increasing levels of expenditure on R&D. This growth and expected enhanced international collaboration, will increase demand and competition for research scientists and engineers.

- Australian studies are inconclusive, but do suggest potential shortages of academic and research scientists and engineers in the areas of science, mathematics, computing, engineering, health, administration and business.

Building critical mass in priority areas

- CSIRO needs to make its own assessments of its skill needs consistent with agreed research priorities. While the number of professional staff has increased by over 300 in the past 3 years, workforce projections need to be done to identify skill and capacity gaps.

- Recruitment strategies for high-demand areas need to address the targeting of outstanding individuals, increasing flexibility in remuneration (including loadings for high-demand areas) and development needs.

- High level management and business training for Chiefs and other senior scientific staff should be expanded.

- Specific emphasis needs to be given to assembling and integrating team skills. This would include the integration of high-level scientific, business and marketing skills as necessary.

- Incentives and rewards to encourage collaborative and team performance need to be developed, noting the potential impact of CRCs and MDPs. Success stories in collaborative research should be specifically highlighted internally (e.g., through CoResearch and performance assessment).

- CSIRO is to review its commitment to sponsoring PhD and post-doctoral training, with a view to supporting students in high priority areas (possibly including an employment commitment). This review should be done in consultation with university, industry and government parties, so as to share costs.

- Secondments to and exchanges with industry should be encouraged at all levels. Specific targets may need to be set.

Box 8: Priorities Decisions 1994-95 to 1996-97

Mineral Resources
Increased appropriation for defined areas of the strategic research base.

Manufacturing
Increase appropriation for defined areas of the strategic research base with expectation that this will produce substantial increases in external earnings in these areas.

Information and Communication Industries
Increase appropriation subject to maintaining CSIRO target for external earnings.

Environmental Knowledge
Total appropriation effort to be maintained through specific proposals in priority Environmental Knowledge areas. Any growth in CSIRO's effort to be largely from external funds.

Environmental Aspects of Economic Development
Appropriation to be maintained at present proportion of effort with requirement that increases will come from external funding.

Plant Production and Primary Products
Proposals to be selective. Recognise importance of soil management in maintaining the productive resource. External funding for forest products to increase to the CSIRO target level.

Animal Production and Primary Products
Proposals should be selective, focusing particularly on product quality and marketability as well as sustainable production systems. Selective support for aquaculture research in anticipation of industry development. External funding should remain at or above the CSIRO target level.

Rural-based Manufacturing
Selective emphasis for processed food area. External funding for forest products to increase to the CSIRO target level.

Energy Resources
Australia's R&D capacity should be increased. CSIRO should position itself as a research resource available to industry with any growth coming from industry input.

Energy Supply
Currently CSIRO's work for this SEO sub-division is undertaken by 11 Divisions. This work will be reviewed by responsible Directors before June 1994 with a view to improving co-ordination and external delivery. External earnings should increase to CSIRO target level by June 1996.

Construction
Nationally, construction industry is becoming increasingly well organised to benefit from and fund research. Expansion of CSIRO effort will be supported by external funding.

Transport
Generic research will be carried out largely under the other Sub-divisions. Direct applications should be externally funded.

Commercial Services
Nationally, Commercial Services provide increasing opportunities for research in a number of areas including Information Technology. CSIRO's major contribution is in areas of Water Services and Utilities. Activity in other areas will depend on identified opportunities and external funds.

Community Services
Expect very little, if any, appropriation funding; targeted applications of research conducted for other purposes; opportunistic approach substantially externally funded.

Health
Strong role for CSIRO activity in the area of human nutrition (Public Health). Involvement in areas of research outside area of human nutrition to be on an opportunistic basis only - substantially externally funded.

Defence
Appropriation funding only if flow-on benefits to other areas are expected; otherwise an opportunistic approach substantially externally funded.

However, experience with the process over the first triennium suggests that substantial improvements can and should be made. The process needs to be much better aligned with the way in which CSIRO research is managed. Its administrative simplicity, efficiency and consistency need to be greatly improved. It is essential to gain commitment and ownership of the process and its results throughout CSIRO. To meet these requirements, the process should be based on a set of clear objectives and principles, understood and adhered to by all involved.

Objectives and Principles

The objective of the research priorities implementation process is:

To allocate funds and resources from an SEO based priorities profile to a line management structure such that the process is owned by managers and that accountability is maintained.

The principles are provided in the Executive Committee document *A Revised Process for Implementation of Research Priorities* (11) released internally in June 1993.

Target Profile

CSIRO's distribution of research at the SEO sub-division level is determined by the Board's priority decisions and the requirement to match priority allocations to sub-divisions at Institute level.

Taken together the Board's priority fund and matching provides a conservative reallocation of funds between SEO sub-divisions. CSIRO's strategic planning processes and the Director's performance agreements will provide the main means of working in the direction of required change within Institutes. The results of this will be that change at the SEO group and class level will inevitably be much greater than at sub-division level.

Research Classification

At its July meeting the Executive Committee confirmed that all research should be classified by beneficiaries but that it should be restricted to the ***main beneficiary*** or at least no more than three beneficiaries New guidelines have been prepared to provide better advice on how to classify research in a consistent manner throughout CSIRO (12). This in turn will provide a basis for monitoring progress towards meeting the target profile at SEO sub-division level.

Development of Research Programs

The role of Lead Director in managing the process of allocating sub-division priority funds to new or existing research programs is set out in the *"Revised Process"* document.

Briefly, the Lead Director consults with relevant Directors and Chiefs to decide on areas of research activity, indicative allocations of funds to each and the Divisions to take part. The latter occurs by invitation to Divisions to express interest in defined areas. The Lead Director then convenes a steering committee led by a broker, generally a Chief, to develop in the period July to October specific research programs and their funding. The Lead Directors then recommend portfolios of research programs for the appropriate SEO sub-divisions to the Chief Executive in November. This is done with a view to reaching overall agreement on recommendations for the December 1993 meeting of the Executive Committee, followed by decisions by the Board at its meeting in December.

Determining research program priorities in the July to December period fits in with the Institute/Divisional planning cycle. From this point onwards research programs, including Multi-Divisional Programs, will be set up to operate by 1 July 1994 and managed in the same way as all other research programs in CSIRO.

Annual Priority Decisions

The decisions on centrally reallocated recurrent funds to SEO sub-divisions are intended to apply for the whole of the budget triennium. However, given sufficient change in the external environment the priority shifts at the SEO sub-division level may be revised at annual intervals by the Board on the recommendation of the Executive Committee.

Lead Directors may propose a mixture of recurrent and non-recurrent funding of individual research programs within the recurrent funding envelope. This may involve such arrangements as boosting some programs over time; short term funding of others, deferred commencement etc.

Role Statements and Planned Outcomes

Final drafts of the SEO sub-division Role Statements are dependent on extensive consultation between Lead Directors following their initial consideration by the Board at its June 1993 meeting. The June meeting of Executive Committee decided to produce a set of Potential Outcomes for each SEO sub-division to complement the Role Statements. It is intended that the Potential Outcomes be visionary, challenging and cover the scope of the SEO sub-division. The identification of and agreement on these outcomes will benefit from the process of brokering priority research programs. The Potential Outcomes by SEO sub-divisions will be prepared for decision by the Board at its December 1993 meeting.

Strategic Plan

Following the Priorities Workshop the Board and Executive Committee agreed to produce a five year strategic plan at the beginning of the second budget triennium to supersede the *CSIRO Strategic Plan 1991-92 to 1995-96* produced at the outset of the first triennium.

The *CSIRO Strategic Plan 1994-95 to 1998-99* will be derived directly from the two key documents from the priorities process : *CSIRO SEO Sub-division Role Statements 1993* and *CSIRO SEO Sub-division Potential Outcomes 1993.*

The relationship between the various steps of preparing the strategic plan and the steps in implementing the second triennium research priorities until the commencement of the triennium are shown in Box 9.

Progress towards meeting the sub-division Planned Outcomes expressed in the *CSIRO Strategic Plan 1994-95 to 1998-99* will be considered each year in the *CSIRO Operational Plan.* Details of how this is achieved are contained in the *CSIRO Operational Plan 1993-94* (13) and *CSIRO Operational Plan Guidelines 1993-94* (14).

Possible Future Developments

At this stage CSIRO has not developed a formal process for building prospective assessments into its process for setting research priorities. Often referred to as scenario planning, prospective assessments provide a means of ordering perceptions about alternative environments in which strategic decisions might be played out.

Shell Australia's involvement in the Chief Executive's Retreat has provided CSIRO with the opportunity of appraising the scenario planning approach of Shell, probably the leading exponent of this approach in the business world.

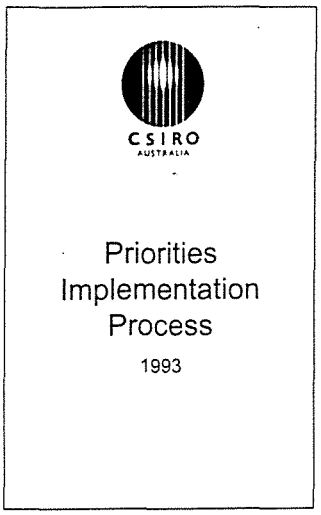
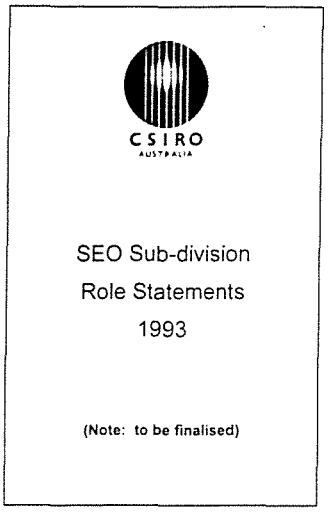
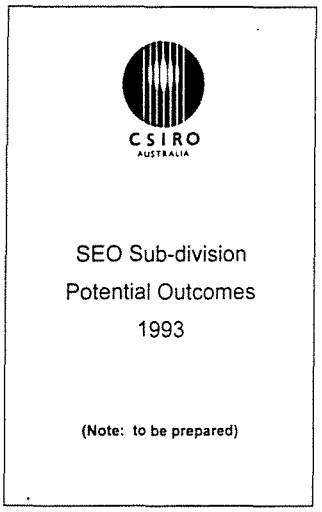
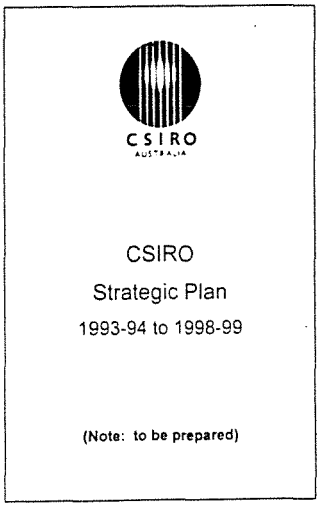
A current secondment by a member of the staff of the Corporate Planning Office to Shell Group Planning in London will assist in assessing whether CSIRO should develop its own form of scenario planning as a key part of the process of preparing for the third triennial review of CSIRO's research priorities. Some early thinking on this subject is contained in the Corporate Planning Office report *Strategic Management in CSIRO* (15).

References

1. *CSIRO Priority Determination 1990 - Methodology and Results Overview,* Corporate Planning Office, January 1991.
2. *CSIRO Priority Determination 1990 - Role Statements,* Corporate Planning Office, March 1991.
3. *Research priorities released,* CoResearch, No. 338, February 1991.
4. *CSIRO's Research Priorities for the 1990s - Whither Agriculture?* John Stocker and Don MacRae, *Agricultural Science,* March 1991.
5. *CSIRO Strategic Plan 1991-92 to 1995-96.*
6. *CSIRO Research Priorities Data Compendium, 1993,* March 1993.
7. *SEO Sub-division Data and Evaluation Sheets 1993,* March 1993.
8. *Science & Innovation,* Discussion Notes from CSIRO Board Workshop, 13-14 July 1992.
9. *Proceedings of the Chief Executive's Retreat,* 8-10 February 1993, Cape Schanck.
10. *Individual SEO Sub-division Score Sheets and Scoring Procedures,* March 1993.
11. *A Revised Process for Implementation of Research Priorities,* June 1993.
12. *CSIRO Research Classification* (in preparation, draft available).
13. *CSIRO Operational Plan 1993-94.*
14. *CSIRO Operational Plan Guidelines 1993-94.*
15. *Strategic Management in CSIRO,* Corporate Planning Office, September 1992.

Box 9: Schedule for Implementation of Research Priorities and Preparation of CSIRO Strategic Plan 1994-95 to 1998-99

Month	Priorities Implementation	Strategic Plan
'93 June	Draft Role Statements considered by Board.	EC agreed on need for Plan.
July	SEO Lead Director consults with relevant Directors and Chiefs to decide areas of research activity, indicative allocations of funds to each and the Divisions to take part. Lead Director commences convening workshops led by Broker (Chief) to develop each Research Program and their funding	CPO requests involvement of Public Affairs.
Aug	Draft Role Statements based on inter-Institute consultation to CPO for circulation to Institutes.	CPO consults Institutes on structure of Plan. Public Affairs consults with Institutes on photographic materials for inclusion in the Plan and ISB on the production of the Plan document.
Sep	Director CSD produces first draft Role Statement for Research Support.	EC 8 Sep agrees on recommended structure of Plan.
Oct	Lead Director finalises development of each Research Program and their funding.	Board 19 Oct decides on Structure of Plan.
Nov	Lead Director recommends portfolio of Research Programs for his SEO to CE along with final Role Statements and Planned Outcomes; Director CSD produces final Role Statement and Potential Outcomes for Research Support; overall recommendations compiled by CPO by mid Nov.	Public Affairs commences preparing draft text for Plan based on final Role Statements and according to Board decisions on structure.
Dec	EC 1 Dec agrees on overall recommendations to Board. Board 14 Dec decides on EC recommendations.	
'94 Jan	Research	Institutes, CSD, CEAUs clear draft text of Plan by late January.
Feb	Programs,	EC 2 Feb agrees on final draft of text for Board. Board 16 Feb decides on final draft.
March	including	
April	MDPs	EC 6 April clears final layout for printer. Board 20 April decides on final layout for printer.
May	are	Receive copies of Plan late May.
June	established.	ISB distributes June-July.

Outputs

(Documents in the course of preparation)