

Regional activity

The potential

- 4.1** The committee heard a variety of views about the possibility of establishing industries based on bioprospecting in regional areas. All acknowledged that original collections and any recollections subsequently needed are made in the area where the organisms of interest occur naturally. However, once species are lodged in collections and associated information about them is in electronically accessible databases, researchers need go no further than to the collections, which are often in major cities. Bioprospecting does not at present generate much employment, and those involved in it are often based in the city.¹
- 4.2** Biodiscovery and any resulting downstream development were also seen by some as being almost entirely city based activities. They argued that biotechnology will be carried out in the major cities because that is where the necessary skilled workforce and the equipment for screening, synthesis and processing are found. Bioindustries will be established in the cities where access to inputs and markets are also better than in regional areas.²
- 4.3** It was suggested that the major use for regional areas in bioindustrial development would be in mass producing raw materials and carrying out preliminary extractions from them. However, for many biodiscoveries,

1 EcoBiotics Pty Ltd, Submission no. 18, p. 2.

2 Department of Agriculture, Fisheries and Forestry - Australia, Transcript of evidence, 2 April 2001, pp. 18, 29; Submission no. 24, p. 8; Western Australian government, Submission no. 32, pp. 1-2.

this was seen as being no more than a short term possibility, lasting only as long as it took to establish synthetic production of desired substances.³

- 4.4** A much more optimistic view of the possibilities for regional development and local employment also existed.⁴ There are, for example, good arguments for having the necessary capacity in regional areas to carry out biodiscovery. Some material does not last well when removed from its environment, and better results are obtained from research on fresh material. Being close to the habitat of the organisms under study also means that seasonal changes and the impact of ecological shocks on organisms can be tracked more easily. These can be significant considerations, for example, because the concentration of bioactive molecules in certain organisms changes with the prevailing conditions, and the evolution of new metabolites may be stimulated by novel environmental challenges.⁵
- 4.5** Despite views to the contrary, regional Australia has great potential to become the supply base for bioindustries. There are, for example, compounds that are too complex or costly to synthesise.⁶ They are sourced more cost effectively by harvesting from the regional sources from which they were first isolated.⁷ Over 25 per cent of the modern drugs that were derived from natural product leads are still extracted from crops of the source plant, although they can be synthesised.⁸ AZGU suggested that 'regional development would appear to be best placed to participate in the production side of new therapeutics'.⁹
- 4.6** AIMS told the committee about several compounds from marine invertebrates and algae that are currently undergoing clinical trials as anti tumour agents. Rather than harvesting fine chemicals from the wild, AIMS is involved with the Queensland Department of State Development and the Coolgaree Aboriginal Community in a project to source them from a sponge farm that is being established near Townsville. For maximum cost effectiveness, such farms need to be situated in the areas where the

3 Department of Agriculture, Fisheries and Forestry - Australia, Transcript of evidence, 2 April 2001, p. 29; Western Australian government, Submission no. 32, p. 2; Associate Professor Robert Capon, University of Melbourne, Submission no. 6, p. 7

4 EcoBiotics Pty Ltd, Submission no. 18, p. 2; Southern Cross University, Submission no. 17, p. 2.

5 Australian Institute of Marine Science, Committee briefing, 3 May 2001; Submission no. 27, p. 10.

6 Australian Institute of Marine Science, Submission to the Voumard inquiry, p. 7; Environment Australia, Submission no. 29, p. 33.

7 Original Oceanz, Smart Ventures Industry Group, Committee briefing, 4 May 2001; Associate Professor Robert Capon, University of Melbourne, Submission no. 6, p. 7.

8 Australian Institute of Marine Science, Submission no. 27, p. 9.

9 AstraZeneca R&D Griffith University, Submission no. 33, p. 2.

sponges occur naturally.¹⁰ A New Zealand example of the benefit that can accrue to a regional area from this type of development is described in Box 4.1.

Box 4.1 Regional benefit from mariculture for chemicals

'The Halichondrins are a novel family of compounds produced by a deep water New Zealand sponge *Lissodendoryx sp.*, about to enter anti-cancer clinical trials. While the species is extremely rare in nature (the entire existing biomass is estimated at only 300 tonnes in a single limited range ...), it is an ideal mariculture candidate. Research into the chemical ecology of these compounds in this species has resulted in optimum culture methods that can return a growth rate of up to 5000% in one month. A joint venture with local industry has been established to produce the 10 tonnes required to supply enough compound for the clinical trials. The cost of producing one kilogram (wet weight) of sponge, with a current value of up to US\$400, is only 50 cents. Should the compounds survive clinical trials, this ratio will decrease as the production scales up to meet the projected annual global demand of up to 60 tonnes. Combined with other supporting commercial ventures established locally (eg plant for chemical extraction and refinement), the capture of value adding biotechnology industry is a potentially massive regional socio-economic benefit.

'... There is also evidence that growing this sponge amongst existing bivalve aquaculture (eg mussels) benefits production of both species and ameliorates some existing environmental impacts of mussel farming.'

Source: Quoted from Australian Institute of Marine Science, Submission to the Voumard inquiry, pp. 7-8.

4.7 Harvesting from aquaculture and plantations on land represents an opportunity for regional development. While plantations of native plant species, such as tea trees, have been established, aquaculture for bioactive molecules is a very new initiative. Fermentation is another option for sustainable production that is ideal for regional development. AIMS claimed that:

If fermentation/harvest/aquaculture modes of production currently being investigated are found to be economic (even with synthetic post harvest manipulations) the options for substantial regional development are enormous.¹¹

10 Australian Institute of Marine Science, Coolgaree Aboriginal Community and Queensland Department of State Development, Committee briefing, 3 and 4 May 2001.

11 Australian Institute of Marine Science, Submission no. 27, p. 5.

4.8 Several organisations made suggestions about the most appropriate focus for the regional development of bioindustries. AFFA and the Northern Territory government stressed that low technology options, such as growing crops for the alternative medicine market, should not be overlooked.¹² A recent report on the potential for Australian agriculture to supply new pharmaceutical, nutraceutical and industrial products reached the same conclusion. It concluded that 'the largest and lowest risk of the markets that Australia is immediately positioned to supply is for functional foods'.¹³

4.9 The UQ suggested that rural areas should focus on:

... products which cannot be readily synthesized, and whose development or processing do not depend unduly on overseas technology. This generally means that it is necessary to look at products which consist of either bulk use of plant or animal parts or at least complex components derived from them. It would be important to value-add locally. ...

Apart from whole plant, animal, insect or microbial products, local industries need to focus on derivative products such as food, fibre and pharmaceutical products. The challenge is to identify and market new products which can compete with or displace traditional products. This is unlikely to apply to staple products but is more likely to apply to specialist niche markets and novelty or lifestyle consumer products.¹⁴

4.10 New bioproducts might also be developed by existing regional industries. For example, mineral companies have an interest in environmentally friendly technologies both for mining and remediation, and regional dairy, meat and sugar businesses could value add by producing new biotechnological products.¹⁵ Some of the bioprocessing enterprises discussed in Chapter 3 are very likely to be established in regional areas, close to sources of supplies.¹⁶ For example, ethanol plants are already in operation and more are being planned for the sugar growing regional centres in Queensland.

12 Department of Agriculture, Fisheries and Forestry - Australia, Transcript of evidence, 2 April 2001, p. 25; Submission no. 24, p. 7; Northern Territory government, Submission no. 4, p. 8.

13 Wondur Holdings Pty Ltd, *New Pharmaceutical, Nutraceutical and Industrial Products: The Potential for Australian Agriculture*, Rural Industries Research and Development Corporation, November 2000, p. x.

14 Faculty of Natural Resources, Agriculture and Veterinary Science, University of Queensland, Submission no. 31, p. 1.

15 Australian Institute of Marine Science, Submission no. 27, p. 10.

16 Biotechnology Australia, Submission no. 25, p. 13.

4.11 A regional location has a number of other advantages:

... operating costs in transport, freight, rates, other resources for industry are lower in the regions, storage handling is cheaper and ports/freight out facilities are usually more assessable [*sic*] and strategically positioned. There are a number of key regional towns ... around Australia that are being identified as the best places for industrial investment because of their very regionality¹⁷

In some of these centres, the cost of living and quality of life are a means of attracting good staff.¹⁸

4.12 AIMS also pointed out that:

There are many examples where biotechnological research and development of mega-clusters have simply been created *de novo* in regional areas (Maryland biotech villages sprang up on the outskirts of Bethesda, Biotech Valley was created in suburban/rural San Diego...). Land is affordable, there is investment and room to grow. Once established, these ensembles of science institutions, companies, scale-up facilities and production industry create their own momentum and infrastructure.¹⁹

This type of cluster development is sometimes referred to as technology parks.

4.13 Given the high unemployment rates in some rural and regional areas, prospects of new economic activities are very welcome. A couple of submissions to the inquiry came from rural areas that were anxious to expand the economic base of their communities and have some facilities and activities on which they felt an industry could be built.²⁰ In this context, the committee noted AIMS' comment that novel tools and products are:

... likely to be accepted and or promoted first and with most ease ... in areas where environment, agriculture, health, welfare and economics are most critical...i.e. the benefits and issues are best appreciated in the regions where there is usually urgent demand.²¹

17 Australian Institute of Marine Science, Submission no. 27, p. 10.

18 Australian Institute of Marine Science, Submission no. 27, p. 15.

19 Australian Institute of Marine Science, Submission no. 27, pp. 10-11.

20 Western Plains Regional Development, Submission no. 7, pp. 2-3; Global Recycling Pty Ltd for Kangaroo Island Nature Lab, Submission no. 16, pp. 1, 5.

21 Australian Institute of Marine Science, Submission no. 27, p. 13.

4.14 The possibility of Aboriginal involvement in industries arising from bioprospecting was also raised with the committee. The sponge project mentioned above is being established near Palm Island near Townsville, and is expected to provide work for about 20 people initially and 10-12 on an ongoing basis.²² Building industries based on traditional indigenous knowledge was also mentioned as a possibility.²³

Case studies

4.15 The committee noted the Western Australian government's comment that there are limited opportunities for establishing regional high technology industries.²⁴ However, during the inquiry, the committee learnt of three regional centres where bioprospecting, biodiscovery and commercialisation of discoveries are being pursued. They are Townsville, Hobart and Lismore. Boxes 4.2 to 4.4 detail the features of each centre and the work they are performing that was brought to the committee's attention for this inquiry.

22 Queensland Department of State Development, Committee briefing, 4 May 2001.

23 Mr Shane Bawden, Submission no. 11, p. 3.

24 Western Australian government, Submission no. 32, pp. 1-2.

Box 4.2 Townsville, Queensland

Population. 135,100 (greater Townsville, June 1998)

Access to biological resources. Situated on the north Queensland coast, Townsville has easy access to the resources of three very different subtropical ecosystems: the Great Barrier Reef, inland savannah, and tropical rainforest. The marine environment is characterised by particularly high biodiversity. Many marine and rainforest organisms have developed chemical mechanisms for defence and attack, which might be used in bioindustries.

R&D resources. The scientific expertise needed to carry out bioprospecting and biodiscovery resides in AIMS, one of the leading institutions of its kind in the world, and JCU, which also has a campus in Cairns where the Rainforest Cooperative Research Centre (CRC) is located. Townsville's developing medical school will provide possibilities for clinical trials. AIMS and JCU scientists collaborate on some projects. AIMS has built a nationally significant bioinformatics database over the last 20 years which covers over 20,000 organisms.

State government support. Through its bioindustries strategy, the Queensland government is actively supporting the development of biotechnology in the state, including bioprospecting and bioprocessing. The state government recently concluded a benefit sharing arrangement with AIMS, which is seen as a model in facilitating the collaborative development of discoveries with international partners. Grant moneys have also been provided, for example, for establishing a local biotechnology network.

Local connections. Local industries with an interest or possible interest in biotechnology include aquaculture, mineral processing, waste recycling and management, and medical diagnostics.

Commercialisation. In addition to the sunscreen and herbicide mentioned in paragraph 2.14, a diagnostic kit for shellfish toxin is being commercialised by AIMS.

Sources: Australian Institute of Marine Science, Committee briefing, 3 May 2001; Submission no. 27, p. 4.

Box 4.3 Hobart, Tasmania

Population. 194,000 (metropolitan area)

Access to biological resources. The Tasmanian, sub Antarctic and Antarctic biota are readily accessible from Hobart. Antarctic microorganisms are of special interest because they are unique, and characterised by adaptations to an extremely cold environment.

R&D resources. There is a strong public sector research base in Tasmania, including the University of Tasmania, state government research laboratories and collecting institutions, the Australian Antarctic Division and CSIRO. Linkages exist between these institutions, including several CRCs. A critical mass of marine biologists, the CRC's collection of over 5,000 Antarctic, sub Antarctic and Southern Ocean microorganisms and CSIRO's collection of micro algae form a strong basis for bioprospecting.

State government support. The Tasmanian government provides support to the extensive public sector research base in the state. In addition, sixty per cent of private land in Tasmania is owned by the Crown, which is therefore in a position to influence access and benefit sharing over a wide area.

Local connections and benefits. Screening for pharmaceutical activity of microorganisms collected by the Antarctic CRC is being carried out by Cerylid Biosciences in Melbourne.

Microbial bioprospecting has brought over \$1 million in research funding from public and private sources into Tasmania since 1997.

Commercialisation. Polyunsaturated acids extracted from Antarctic microorganisms represent a commercial possibility. An attempt to form a joint venture for their further development failed, for some of the reasons listed below.

Sources: Tasmanian government, Submission no. 23; The Australian Society for Microbiology, Submission no. 10; Transcript of evidence, 25 June, p. 95.

Box 4.4 Lismore, New South Wales

Population. 42,954 (1996 census)

Access to biological resources. The rainforests of Northern New South Wales represent a source of considerable biodiversity. In addition, this region and the neighbouring cooler inland areas have recently become a significant centre for growing and manufacturing medicinal plants. They produce much of the Australian sourced material for the medicinal plant market.

R&D resources. SCU is concentrating on developing a small number of centres of excellence with regional significance. One of them is the Cellulose Valley project (CVP), which 'will position the Northern NSW region and Australia, as the global hub of primary production, manufacturing and research for medicinal plant products and related products'. Several centres and schools at SCU contribute to the project, including centres for phytochemistry and plant conservation genetics, a school of natural and complementary medicine, an institute of health research, and an environmental analysis laboratory.

The colocation of plant genetic and phytochemical research capacity represents a powerful resource. Not only can bioactive chemicals be isolated and characterised, but their genetic basis identified. The two recently established centres for phytochemistry and plant genetics are expected to grow rapidly from their current staff of 100.

State government support. State (and local) government has assisted the development of the concept behind CVP and the technology park. The park is one of five research parks in the state, and the world's first park of its kind.

Local connections and benefits. Partners in CVP have strong links with businesses (such as Fauldings, Blackmores, Mediherb, BioProspect Ltd, Lane Laboratories, and Thursday Plantations) and with primary industry organisations such as the Organic Herb Growers and the Tea Tree Growers Association. CVP partners have attracted at least \$16 million dollars in research grants to SCU.

Commercialisation and commercial opportunities. At present, most natural plant product manufacture is carried out elsewhere, but it is hoped that the technology park will house, among others, companies developing, commercialising and manufacturing products from crops developed and grown locally. As about 90 per cent of the Australian natural plant product market is supplied from overseas, there is the potential for significant increase in local production. In addition, the global market for medicinal plant products is growing fast.

Commercialisation of bioactive substances bioprospected from Australian material is already under way with BioProspect having recently established a presence in Lismore, close to Australian Phytochemicals Ltd, its joint venture with the university's Centre for Phytochemistry. The Centre for Plant Genetics is already selling genetic information over the internet.

Sources: Southern Cross University, Submission no. 17; Southern Cross University and BioProspect, Committee briefing, 6 July 2001; 'Cellulose Valley: The gateway ...', Southern Cross University.

- 4.16** Another centre that is pursuing regional development through its access to marine resources is the University of Wollongong. This initiative includes bioprospecting the local marine flora and fauna, fundamental research, building 'an extensive collection database' for the temperate marine environments, similar to that at AIMS', and aquaculture.²⁵
- 4.17** The common features of bioindustrial activity in all three centres are access to biological resources, a strong research base, government support, and links to businesses that can carry discoveries forward. In all cases networks are very important, both within the local area and further afield. The committee believes that, while considerable development based on bioprospecting is possible in certain regional areas, regional areas cannot manage on their own. As UQ pointed out :
- ... benefits through IP-protected value-added industries in regional and rural areas will sometimes be maximised through intermediate steps in product research and development carried out in a biotechnology hub such as the UQ precinct.²⁶

Impediments

- 4.18** Impediments to establishing regional bioindustries have been identified from the case studies and other information given to the committee. They are summarised below, along with the suggestions about how they should be addressed. Many of the impediments are not peculiar to bioindustries, but are faced by any type of novel, regional, industrial development. Some of the critical requirements for success that were lacking at all or some of the three centres are:
- support in the regions for early stage development of biotechnological leads;²⁷
 - access to grants;²⁸
 - appropriate research facilities, including the possibility of pooling equipment and infrastructure as happens in larger centres;²⁹
 - adequate salaries to attract and retain researchers;³⁰

25 Dr Kirsten Benkendorff, University of Wollongong, Submission no. 38, p. 2.

26 Faculty of Biological and Chemical Sciences, The University of Queensland, Submission no. 26, p. 2.

27 Dr Kirsten Benkendorff, University of Wollongong, Submission no. 38, pp. 4-5; James Cook University, Submission no. 22, p. 2.

28 Australian Institute of Marine Science, Submission no. 27, p. 14.

29 James Cook University, Committee briefing, 4 May 2001.

- critical mass in the research community;³¹
- a skilled workforce, including skills in the research community in IP, project and financial management;³²
- entrepreneurial skills and leadership;³³
- interest in the local business community in biotechnology;³⁴
- regional infrastructure, particularly high speed telecommunications links;³⁵
- investment, including that needed to meet the high cost of venture capital and IP protection;³⁶ and
- links between the stages in product development, for example, between researchers and companies that might develop leads.³⁷

Distance from the state and federal capital cities seemed to staff at regional centres to be an important reason for their failure to influence policy development and to make their case for funding.³⁸

Solutions

4.19 Several suggestions were made to the committee about how the problems listed above might be resolved.

- Business development programs and support for start up companies need to be better targeted to regional areas.³⁹ Some assistance to start ups may come from the extra funding assigned for the redesign of CRCs to make them more accessible to small and medium enterprises.⁴⁰
- Hiring a high flying researcher, providing equipment, and building an effective team around this person are a way of helping to create critical

30 James Cook University, Committee briefing, 4 May 2001.

31 James Cook University, Committee briefing, 4 May 2001; Department of Agriculture, Fisheries and Forestry - Australia, Transcript of evidence, 2 April 2001, pp. 28-9.

32 James Cook University, Committee briefing, 3 May 2001.

33 James Cook University, Submission no. 22, p. 2.

34 James Cook University, Committee briefing, 3 May 2001.

35 Biotechnology Australia, Submission no. 25, p. 16; James Cook University, Submission no. 22, p. 2.

36 Australian Institute of Marine Science, Submission no. 27, p. 14.

37 Australian Institute of Marine Science, Submission no. 27, pp. 14-15.

38 Committee briefing by the Australian Institute of Marine Science, 3 May 2001.

39 EcoBiotics Pty Ltd, Submission no. 18, p. 2.

40 Biotechnology Australia, Transcript of evidence, 2 April 2001, p. 25.

mass and an attractive work environment for research. CRCs are also an excellent means of supporting networking.⁴¹ In addition, the higher education white paper promoted the role of universities in regional development.⁴²

- If university researchers had lighter teaching loads, the extra time they would have would enable them to take a more entrepreneurial approach to commercialising their discoveries.⁴³ The committee noted that the 1999 higher education white paper put in place a new policy framework which included enhancing the development of a more entrepreneurial culture in the higher education sector.⁴⁴

4.20 The committee believes that attempts to establish regional industries based on bioprospecting need to be seen in the context of all the activity in biotechnological and other research fields across the country and all the efforts being made to commercialise Australian research.

4.21 A number of Commonwealth government programs were brought to the attention of the committee as open to application by those interested in biodiscovery and its commercialisation in regional areas. They include some dedicated to biotechnology alone, such as the \$40 million Biotechnology Innovation Fund. This fund addresses the gap between research and commercialisation, for example, by providing pre seed funding for start up companies. The proposed Biotechnology Centre of Excellence, which is likely to comprise virtual elements as well as new, centralised infrastructure, could incorporate regional centres into its network.⁴⁵

4.22 Other more generic programs are also open to biotechnology interests. Some of the Commonwealth government's annual input of \$250 million into biotechnology is spent as:

- Australian Research Council (ARC) grants;
- Research Infrastructure Block grants for universities;
- funds for major national research facilities;
- funding for CRCs;
- the Innovation Access Program, which links Australian companies with overseas markets;

41 James Cook University and the Rainforest Cooperative Research Centre, Committee briefing, 4 May 2001.

42 Biotechnology Australia, Submission no. 25, p. 15.

43 James Cook University, Committee briefing, 4 May 2001.

44 Biotechnology Australia, Submission no. 25, p. 15.

45 Biotechnology Australia, Transcript of evidence, 2 April 2001, p. 14.

- pre seed funding for universities and public sector research institutions;
- the R&D Start and Commercialising Emerging Technologies programs;
- funding for research and development corporations in the AFFA portfolio;
- AFFA's Farm Innovation and New Industries Development programs (NDIP);
- support for education and training in IP management.⁴⁶

4.23 In addition to the above are a range of Commonwealth programs that promote business development. They provide support for:

- 119 Pooled Development Funds, ten of which are devoted to biotechnology;
- the Export Market Development Grants scheme;
- the Innovation Investment Fund; and
- the Technology Diffusion Program.⁴⁷

4.24 Some of the programs listed in the last two paragraphs will bring benefit to regional Australia. Examples of these are funding by the ARC and NDIP, and the MNRFP programs. Furthermore, InvestAustralia, the Commonwealth government's national investment agency, has established a team to promote regional investment, both small and large.⁴⁸

4.25 State programs also address some of the impediments identified in this chapter through their support for regional development and biotechnology.

4.26 The committee found that some of those it spoke to were not well informed about the range of programs available to support the development of bioindustries. The committee acknowledges that *National Biotechnology Strategy: Progress and Achievements*, which is accessible from BA's web site, contains information about grants schemes.⁴⁹ However, the committee believes that this information could be provided in a more accessible form, and recommends accordingly. The committee sees the dissemination of information as a significant issue and returns to it again in Chapter 6.

46 Department of Agriculture, Fisheries and Forestry - Australia, Supplementary submission no. 35, pp. 1-2; Biotechnology Australia, Submission no. 25, pp. 14, 18-19.

47 Biotechnology Australia, Submission no. 25, pp. 22-3.

48 DTRS, 'Economic and business development', http://www.dotrs.gov.au/budget/regional/2001_2002/industry_science.htm, accessed 23 July 2001.

49 *Australian Biotechnology: Progress and Achievements*, Commonwealth of Australia, 2000.

Recommendation 17

- 4.27** The committee recommends that **Biotechnology Australia make information about grant programs available on its web site in a clear and easily accessible form, and provide a link to the GrantsLINK web site.**
- 4.28** The committee recognises that current funding programs and recent changes to them were introduced to address some of the impediments identified earlier in this chapter. Examples of this are funding for the early stages of commercialisation and support for better collaboration between researchers and between industry and researchers. The committee is also aware of a number of initiatives introduced to stimulate regional development since the Regional Australia Summit held in October 1999.
- 4.29** The committee believes, however, that more needs to be done to stimulate the development of regional bioindustries. Excellent regional R&D projects, such as those based on bioprospecting, should not be turned down because of limitations that arise simply as a function of their locality. The Commonwealth government should develop a new focus on bioprospecting, biodiscovery and bioindustries in its R&D and regional development programs.
- 4.30** One element of this new focus might be to support all the components of rural business development including the basic scientific R&D, the production sciences, and business and social infrastructure. This approach was put to the committee by UQ, which argued that sufficient funding must be available to see projects through to fruition, with project success being measured in terms of their social and economic contributions to rural communities as well as direct commercial returns. The University proposed that:

One approach could be the establishment of a targeted R&D program with the charter of supporting research and innovation in bioprospecting/rural industries. This might be managed through an existing body (eg. RIRDC) or a new organisation. There should be a mix of funding models from full public funding to various levels of matching industry funds as happened for other rural industries already.⁵⁰

50 University of Queensland, Faculty of Natural Resources, Agriculture and Veterinary Science, Submission no. 31, p. 2.

This proposal received the support of the Marine Bioprospecting Coordinator from the University of Wollongong.⁵¹

4.31 UQ observed that:

Such a funding arrangement overlaps with existing research funding arrangements, but it provides the focus on bioprospecting and rural development. In the past otherwise worthy projects have not been funded because they fall in the gap between the existing funding bodies. While such a program could be spread across existing funding channels by designation of a national priority, such an approach is unlikely to achieve the same level of integration and focus.⁵²

4.32 The committee is sympathetic to the problems of projects that are not supported because they 'fall in the gap between existing funding bodies'. It does not believe, however, that a new organisation is the best method of addressing the development of new rural industries, such as those based on bioprospecting.

4.33 The committee prefers the option of pursuing this issue through the Rural Industries Research and Development Corporation (RIRDC). The committee notes that the RIRDC's priorities include the development of biotechnology and its programs support new and emerging industries, such as tea tree oils. The committee's attention was drawn to the RIRDC's report on the potential for Australian agriculture to produce new pharmaceutical, nutraceutical and industrial products, published in November 2000. A workshop on the report is planned for September 2001 to consider what future action should be undertaken. The RIRDC is also organising a session on these industries for the 2002 Outlook conference.

4.34 In addition, the committee notes that the RIRDC also considers broader issues of concern for rural communities and industries. One of its priorities is the fostering of creativity and innovation. It has, for example, recently published a handbook on small town renewal.⁵³

4.35 The committee congratulates the RIRDC on the work that it is carrying out to identify new industries and stimulate regional development. It urges the RIRDC to give a higher profile to promoting cropping and industrial development based on the bioprospecting of Australia's native biota. The RIRDC should also further pursue the possibilities for novel bioprocessing using introduced plants. The committee also believes that the RIRDC

51 Dr Kirsten Benkendorff, University of Wollongong, Submission no. 38, p. 5.

52 University of Queensland, Faculty of Natural Resources, Agriculture and Veterinary Science, Submission no. 31, p. 3.

53 Rural Industries Research and Development Corporation, Home Page, <http://www.rirdc.gov.au/>, accessed 24 July 2001.

should also enlarge its work on value chain and whole of community development.

Recommendation 18

4.36 The committee recommends that the Rural Industries Research and Development Corporation:

- **aggregate funds into a specific program for researching and promoting the development of industries based on bioprospecting Australia's native biota and bioprocessing using introduced plants; and**
- **implement this program in the context of all the components of business development involved in establishing a new industry.**

4.37 The committee further expands on its views on a new focus by the Commonwealth government on bioprospecting, biodiscovery and bioindustries in its R&D and regional development programs in the next chapter. In that chapter the committee proposes a national strategy for the development of biobased industries.