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Secretary: *Sarah Hnatuk*  
**RECEIVED**  
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HOUSE OF REPRESENTATIVES  
STANDING COMMITTEE ON  
PRIMARY INDUSTRIES AND  
REGIONAL SERVICES

The Committee Secretary  
Standing Committee on Primary Industries and Regional Services  
House of Representatives  
Parliament House  
CANBERRA ACT 2600

Faxed 23/5/01

Dear Sir

**Inquiry into the Development of High Technology Industries in  
Regional Australia Based on Bioprospecting**

I am pleased to attach a submission to the Standing Committee on Primary Industries and Regional Services from the University of Queensland with respect to the Inquiry identified above.

Yours sincerely

Professor John Hay  
Vice-Chancellor

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# **BIOPROSPECTING AND REGIONAL INDUSTRY DEVELOPMENT IN AUSTRALIA**

## **SUBMISSION FROM THE UNIVERSITY OF QUEENSLAND**

There is boundless potential to harvest natural products from the natural biological resources of Australia. The useful products cover a wide range from pharmaceuticals and basic material for industry to new food or amenity crops. The extremely large biodiversity of Australia plants, animals insects and marine life provide massive opportunities for discovery of new materials. However, this submission does not attempt to address the scientific and technical issues associated with production, harvesting of, or value adding to particular products. Many of the problems and solutions are generic in principle. The main issues addressed here are the structural problems that limit the opportunity to realise this potential harvest for the benefit of rural industry development in Australia.

The difficulties faced by Australia in capturing the returns from the natural products chemical industry have been well documented. The essence is that many natural substances can often be readily manufactured or processed (value added) but the technology to do this, and the access to the markets, is dominated by overseas-based, multinational corporations. They usually reap the real benefits rather than the Australian industries. For Australia to compete in other than a minor way would require a very large investment in basic and applied research as well as in product development. The breakthroughs are hard to predict and will arise from a strong and unfettered university and government research program sector.

For rural areas to have a role, the focus should be 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 be able to value-add locally. The return on such products depends heavily on 'ownership' of the genetic resource.

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.

Again, most of the technology and enterprise skills behind these products are generic. It is the creative application of these technologies which is the key to success. A successful rural enterprise or industry requires the integration of appropriate technologies into a supply chain or network. This must include links to international partners, but should be largely homegrown if Australia is to capture adequate return.

The University of Queensland (UQ), in collaboration with other institutions, has already recognized the need for this integrated approach to rural development. This is evident from the commitment to develop the Gatton campus as a focal point for education and research pertaining to the primary industries and rural environments. The Centre for Rural and Regional

Development, initially a joint venture between UQ and the University of Melbourne but engaging collaboration with other institutions across the nation, provides a focus for rural development and capacity building.

As a research intensive, comprehensive University, UQ has the capacity to tackle all aspects of basic biological, chemical, physical and agricultural sciences through the rural development from the production sciences to the business and social infrastructures. It has a track record across these disciplinary areas with a particular emphasis on tropical biology. An important part of this is the emphasis within the University on building closer collaboration between the disciplines and across the various Faculties.

What is needed now is the commitment to support R&D across all the underpinning components. The basic and strategic research must be translated to application. The applications must be integrated into industrial systems. This R&D must be accompanied by appropriate business development and commercialisation. Rural communities and industry players must be part of the process.

Various organisational structures could be envisaged but more important is the commitment of sufficient funding to see the whole process through to fruition. The success of the program must be measured in terms of contributions to rural communities (social and economic) as well as direct commercial returns. On this basis substantial public investments is warranted. The high risk and long-term nature necessitates initial public investment with mechanisms to recoup the benefits from successful future ventures. The funding cannot be dependent solely on venture capital from industry where unproven new industries such as these are concerned.

Concurrently, there needs to be engagement of the rural communities. There needs to be adequate attention to the aspirations and requirements of rural communities to ensure that the necessary human resources are available. There needs to be incentives and the commitment of resources to enable community engagement. It must be recognized that successful rural communities and enterprises bring substantial benefits to the dominant urban populations.

From a human resources perspective, greater funding of programs to enable rural communities to access education and training is vital. This should include a greater financial support to students attending educational institutions, recognizing the real costs to families and communities, perhaps with linked incentives to return to rural communities for a period after graduation. Conversely a greater injection of capital is needed to make use of flexible delivery and computer-based technologies. This should cover both the hardware and development of the software. Much of the technology exists but the funds and infrastructure are not sufficient to enable its implementation.

To achieve a commercially viable outcome there needs to a strong commercial focus. However, the milestones must be tempered with a realistic input of funds and timeframe. As stated previously, cutting corners so that critical links in the chain are overlooked will lead to failures. It is also vital that creativity and lateral thinking is not stifled by undue focus on predetermined outcomes.

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. The charter must explicitly cater for strategic ('blue sky') research

as well as direct applied research and R&D. The funding should specifically support postgraduate and postdoctoral awards in targeted disciplines. Membership of the granting body should have a balance of scientists versus industrialists to ensure that longer-term and meritorious blue sky projects are funded, as well as those with immediate commercial potential.

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.

May 2001