



NSW North Coast Sustainable Aquaculture Strategy-Land Based Aquaculture

Readers' Note

This document is part of a larger publication. The remaining parts and full version of the publication can be found at:

<http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/general-management-and-policy/nsw-north-coast-sustainable-aquaculture-strategy>

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Business Planning

NSW North Coast Sustainable Aquaculture Strategy
Land based aquaculture
August 2000

A NSW Government Initiative

North Coast Sustainable Aquaculture Strategy

A NSW Government initiative of NSW Fisheries, Department of Urban Affairs and Planning, Department of State and Regional Development, Environment Protection Authority, Department of Land and Water Conservation, National Parks and Wildlife Service and NSW Agriculture to encourage sustainable aquaculture in New South Wales

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1. Sound business planning is Key to success

Land based intensive aquaculture in its various forms requires a fair degree of technical skill as well as prudent business planning and management. It is often said *most people do not plan to fail, they simply fail to plan*. Sound planning is the key to the success of an aquaculture business. A business plan provides for a rigorous evaluation of the business idea and a blue print for the future operation and growth of an aquaculture business. A business plan may be the only tangible aspect of a business in its early stages of development.

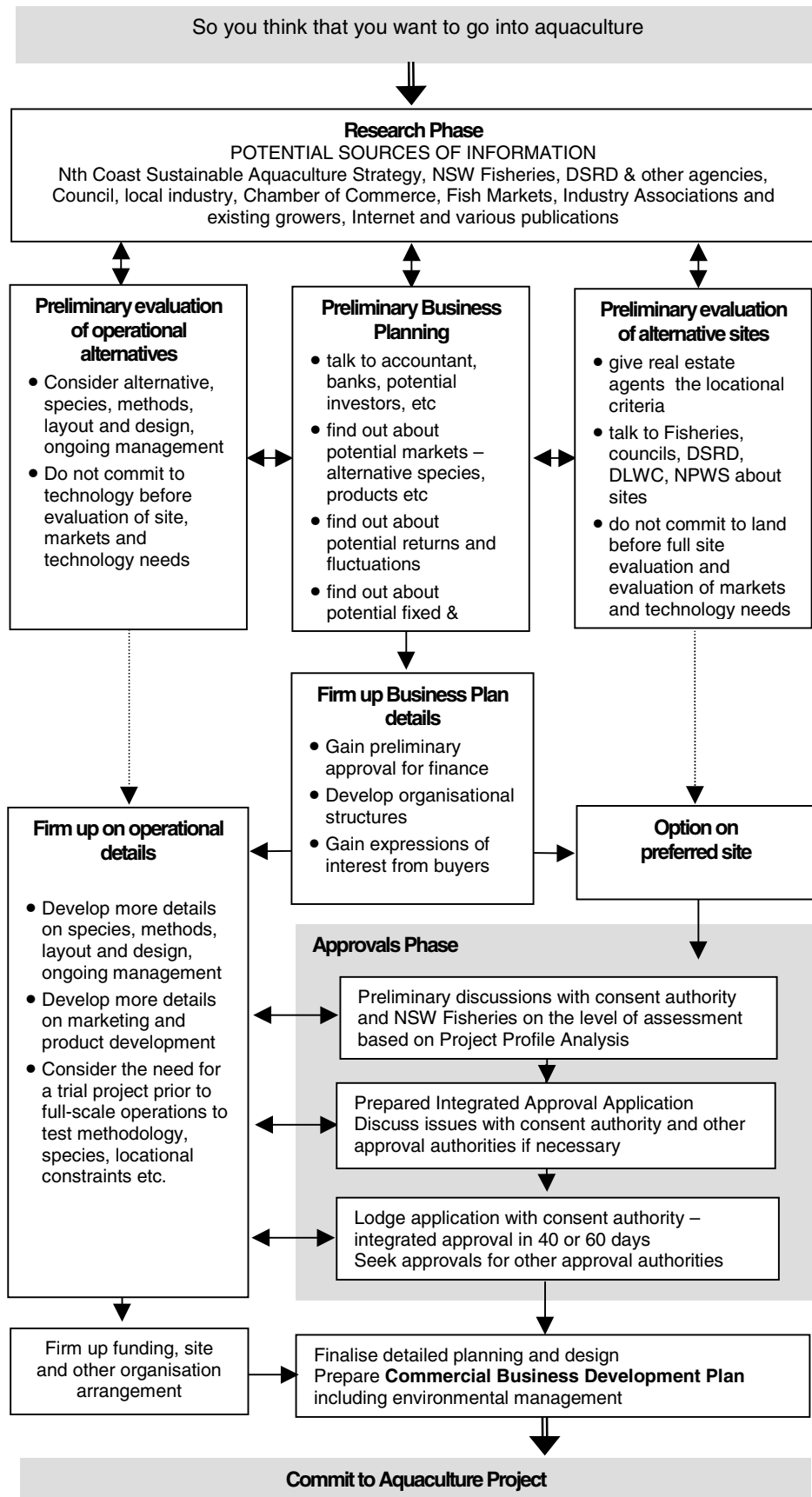
It is recommended that a business plan be prepared before making any financial commitments in terms of land, plant or equipment. The plan will identify the potential profitability of the enterprise. The business plan should establish the objectives for the business and provide performance targets that can be measured.

A written plan provides the means to think through all aspects of a new business and to examine the consequences of a range of alternative management, marketing, finance and people strategies. A business plan will help prevent mistakes being made which could be anticipated and solved on paper.

In addition to identifying the expectations of the business owners in terms of goals, the business plan provides the information needed by potential lenders or investors to evaluate the venture, when seeking external financing or a business loan. This is most important as many investors or financial institutions are not familiar with aquaculture. The business plan needs to demonstrate the solid reasoning behind the venture and the justification for financial support. A thorough business plan automatically becomes part of a financial proposal that will meet the requirements of most lenders and investors.

An action plan for implementing the business plan should then be drawn up with detailed staging and schedules for tracking the steps to implement the plan. A number of useful project management software packages are available for undertaking this task. They provide an important and useful means of storing, documenting, reporting and monitoring the implementation of the project.

Figure 1. Business and Project Planning



2. Organisational structure

Aquaculture is a business and like other businesses, potential investors should evaluate the pros and cons of various organisational structures and select a structure that offers them the most advantages.

Factors in the choice of organisational structure for an aquaculture enterprise include access to resources, management issues, long term plans, interrelationships, liability and taxation issues. While currently sole proprietorship are the most common organisational structure for aquaculture enterprises, there is likely to be increase in other structures in the future.

Advice should be sought from a business planner or accountant regarding the organisational structure that best meets the needs of the aquaculture enterprise at its particular phase of development.

ORGANISATIONAL OPTIONS

Sole Proprietor

The principal advantage of a sole proprietor structure is that it provides total management control and is probably the simplest in terms of start-up and record keeping. However resources are often limited and personal assets are often put at risk. Farm efficiency will vary with the abilities (and often health and well being) of the sole proprietor.

Partnerships

Partnerships involve more than one individual and while still having many of the characteristics of sole proprietorship, has the added advantage of additional resources in terms of assets and additional personnel. The structure of the partnership (limited or general) will affect factors such as liability, management responsibilities and ease of exiting the partnership. As a structure, it offers little advantage for estate planning or continuity of operation over the sole proprietorship.

Corporation

The primary advantage of a corporation is access to resources, limited liability of participants and continuity of operation. Depending on the structure of the corporation, there can also be tax advantages. However there is likely to be increased complexities in decisions making as control is shared between shareholders, the board and management (depending on the structure). There can be a significant increase in complexity in accounting and record keeping. Incorporation of a farm business can however help to provide for the transfer of shares to new owners and can simplify estate planning.

3. Outline of a business plan

The business plan should contain marketing, production and financial strategies for the establishment and operation of the business with a program to monitor the implementation of these strategies to achieve the business performance targets.

The business plan should outline what will be produced, where it will be sold and how profitable the activity is likely to be. This may include the production of existing product lines in existing markets or new product lines and new markets. The big questions to be addressed in business planning are:

Market feasibility:	What product is to be produced? Who will buy it and for how much?
Production feasibility:	How much will it cost to produce and sell?
Financial feasibility:	Will the profit exceed the costs?

There are a number of different formats for business plans depending on the type and source of funding sought. The following format includes the key issues that would normally be required.

OUTLINE OF A BUSINESS PLAN

Executive Summary

- Objectives of Business
- Current Analysis
- Profit Projections
- Capital Funding Requirements
- Key Factors

The Business

- Resume of Owner(s)/ Proprietor; Organisation Structure: Partnership, Pty Ltd, Company, etc; Main Activities / Unique Features
- The Business Objectives
- An outline of all aspects of the business
- Development schedule
- Strengths and Weaknesses - Past experience - Current Performance
- Opportunities and constraints – markets, locations, relationships etc
- People: Customers; Staff; Suppliers; Contractors/ services

Market feasibility

1. Industry Analysis

- Overview of the Industry
- Industry Characteristics
- Economic Trends
- Consumer Trends
- Social and/or Political Considerations
- Price Sensitivity of Industry

2. *Product Range/Service*

- Product Description
- Strengths/Weaknesses
- Opportunities/Threats
- Future Development

3. *Marketing*

- Marketing Strategy
- Target Market / Customer Profile
- Market Size / Market Share / Market Potential
- Competition / Pricing Policy
- Key Factors Influencing Market / Research and Analysis
- Advertising and Promotion
- Sales and Distribution

Production feasibility

4. *Production / Harvesting / Processing*

- Quality Control
- Strengths/Limitations
- Expansion / Capacity / Scheduling
- Equipment Requirements
- Material Requirements

5. *Management and Staffing Strategy*

- Key Management
- Staffing Requirements – full time/part time/peak activities
- Training and skills
- Duties and Responsibilities

Financial feasibility

6. *Financial Information*

- Current Position
- Income and Expenditure Projections / Profit Budget / Balance Sheet / Cash Flow Forecast / Break Even Analysis
- Start-up Capital/ Operational Capital Requirements
- Sources of Finance
- Timing and Stages of Finance
- Fixed Asset Requirements
- Tax issues

7. *Supporting Documents and Miscellaneous*

- Business Advisers, Accountant, Solicitor, Banker
- Legal Documents/Leases or Contracts
- Letter of Intent
- Research Documents / Patents or Trademarks

4. Market feasibility

A marketing strategy is often the hardest part of an aquaculture business plan but it will fundamentally influence its profitability. Issues that need to be addressed in a market feasibility analysis include:

1. Should the farm concentrate on a single species and a single product or a number of species and a number of products?
2. Should the farm concentrate on high value products or volume throughput?
3. Should the products be sold directly to the customers or through retailers, wholesalers or the Fish Markets? What is the implication for market size and return per unit?
4. How should the farm interact with other aquaculture business with regard to marketing? Should the farm try to differentiate its products from others in the market place and how?
5. How should the farm interact with the tourism / recreational market?

The market analysis should demonstrate that there are enough customers for the proposed product and that there is potential for growth or diversification in the market. This analysis should influence the choice of species to be grown and may influence the site selection (See *Species and Site Selection Section*).

4.1 Potential customers

Potential customers need to be identified within the “market” area. These include wholesalers, restaurants, seafood stores, supermarkets, institutional buyers, and individuals. In addition to markets for food consumption, supplementary market niches for fishing bait or pet food particularly in relation to waste minimisation could also be considered. The short term and also longer-term potential customers should be identified. Regional Development Boards, Department of State and Regional Development, Chambers of Commerce or the Yellow Pages are some of the potential sources of information of business and consumer data that can help to identify the numbers and location of potential customers. In addition the Sydney Fish Market is a key source of important information on market trends and opportunities and updated sales figures can be accessed on the Internet daily.

The market for prawns, fish and other shellfish can be very variable (See *Species section*). Each market segment can have its own pattern that can affect quantities and types of product purchased, price and demand for “value-added” products. It is critical that potential customers are consulted about their likely needs and how these could change during the year or in response to other factors. For example, the sizes of the fish or prawns required, whether they want them live, fresh or frozen or whether they want them whole or headed and gutted. In addition the likely demand for value-added products such as smoked, special fillets or other processing should be identified. Consideration should be given to whether certain species are in short supply at certain times of the year. Can these species be grown and harvested to meet these periods of short supply? Can the harvest cycle be managed so that it does not coincide with periods of oversupply or when there are plentiful substitutes? The likely price differentials and sensitivities should be identified.

4.2 Positioning the product

It is important to identify where the competition is likely to come from in terms of other aquaculture producers, products caught in the wild, imports and substitute products. Many fish products command high prices as luxury food items that are characteristically in short supply. Since demand is limited, increased production could result in reduced product returns unless new “luxury” markets are identified. Other fish products command lower prices and compete with substitutes such as chicken, beef and pork as well as cheap overseas imports. As the quantity of fish consumed per person remains relatively low, growth in this “bulk” market is likely to be very competitive.

In some cases, the product can be “positioned” to maximise returns by creating or taking over a high return boutique market. Market advantages should be recognised and used. For example for some products, there is a perception that farm-raised fish or prawns are fresher, healthier and of higher quality than wild-caught species. The positioning of the product may require innovative packaging, pricing or promotion to achieve and maintain that position. In some cases, this can be achieved by individual producers, by a group of producers in a region (eg Clarence Valley) or by an industry sector as a whole (eg the silver perch growers). Emphasis on careful handling, cleaning, processing, packaging, transport and reliable quality service is important to develop, maintain or expand the market.

4.3 Promotion

Promotion of products creates customers. One of the best forms of promotion is the product itself, where the reputation of a high quality product within the market place serves as the promotion of the product. In addition however, time and resources should be set aside to promote the product. This promotion may dovetail with the promotion of the region say the Clarence Valley or the industry as a whole – say the silver perch industry. However for small scale operations personal promotion with regular contact with the customers is probably more effective particularly as it provides opportunity for feedback from the customers. In addition, some on-site promotion can help to accent the non-price attributes of the product and provide the customers with a better understanding of aquaculture. Either approach could be reinforced by promotion tools such as recipes or other forms of industry wide promotion such as flyers and posters.

4.4 Distribution

Another very practical issue in determining the size and type of market, are the issue of market access and how the products reach the customers. It is important to determine what delivery options are currently available (using agents, distribution companies or own staff). Determine the area which can/could be reached using these options or combinations of these options. With a small operation, allocating staff for sales and deliveries will impact upon other production activities. Direct deliveries to speciality markets often has the greatest potential for the highest return per kilogram but the full costs in terms of staff time and transport costs should be considered. A budget should be developed keeping in mind that it is usually more expensive to establish a new market than to service an existing market.

4.5 Factoring in tourism

Another issue is the potential for additional returns from the interaction with the tourist industry. In addition to the potential for sale of product at the door, there is the potential to charge access to tour groups. However it is important that the full costs of additional facilities (eg customer amenities, sales display area and equipment, additional staff costs) and the costs associated with disruption to the daily operations of the farm are fully considered. The other potential fringe activity for fin fish farms is the stocking of fishout ponds for recreational fishing activities (*see Planning and Design Section*).

5. Production feasibility

Having determined that there is a market for the potential product, it must then be determined that production is feasible and that the product can be produced reliably, efficiently and economically.

A production feasibility analysis needs to consider the fixed and variable costs associated with factors such as the site, species to be produced, production methods, infrastructure requirements, human resources and quality controls. Feed and costs associated with feeding are often the most important variable cost and the profitability of the enterprise will depend on the feed costs and feeding efficiency. In the production feasibility analysis, consideration should be given to changing feed costs to test the sensitivity of the production viability with these changing costs. (*See Planning and Design and Operating the Farm Sections*)

Start up costs will depend on the extent to which land, plant and equipment are available or have to be purchased for the aquaculture enterprise. As the land costs are a significant start up cost, site selection is a key business planning issue. The availability of a large enough block of land which meets the “preferred” selection criteria will vary within the Region as will the cost. In addition, a range of variables in terms of temperature, rainfall, access and cost of water, distance to markets and sources of fry will also affect start up and operational costs. These factors should be considered in the selection of sites (*see Site Selection Section*). Choice in terms of capital investment will also affect variable and fixed costs – say in relation to plant and equipment and construction of dams, ponds, sheds and other facilities.

The production feasibility should also consider the management of the enterprise and the ability of management to make decisions and take actions for the reliable production of product. Issues include the availability of suitable experienced and skilled staff or advisers and/or access to appropriate training and instruction so that the enterprise can be run smoothly.

6. Financial feasibility

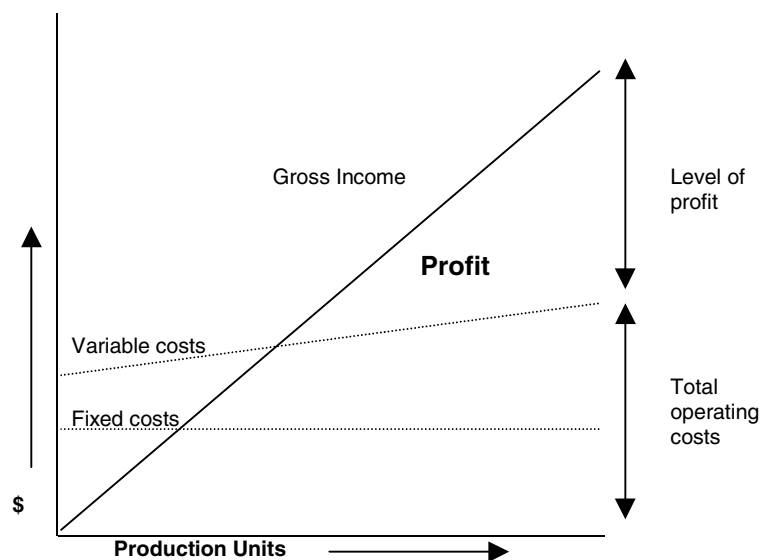
A cash flow projection plan is one of the most important of the financial documents included in a business plan. It forecasts expenditure outflows as well as profits and ensures that money is available when needed. The cash flow statement should show how much money is required, when it is required, and when it will be available. This is particularly critical for those enterprises where there will be a single harvest per year while the expenses will be spread out over the year.

The cash flow statement will help predict if there is likely to be a cash gap. It should also include timing of capital investments and managing of borrowings particularly if future expansion of the operation is proposed in the business plan. A cash flow projection plan should include monthly budgets for at least the first 18 months but preferably 3 years or until the operation is likely to be in the black. In many operations, expenditure occurs in spurts, with a high level of costs at stocking and harvest times with a lull in between.

The business plan should distinguish between fixed and variable costs.

- Fixed costs are associated with those costs that do not change over the short run such as full time employee salaries, overheads, insurance and depreciation (on ponds/tanks, plant and equipment).
- Variable costs change with production levels and include costs of juveniles, feed, chemicals, water, electricity and casual labour.

Figure 2. Considering fixed and variable costs



On the revenue side, there can be difficulties in predicting variability in prices and quantities likely to be harvested. In developing the plan, the assumptions used to arrive at the predictions should be included. Advice should be sought from NSW Fisheries if necessary. The sensitivity and risk analysis should consider variations in sale price for various products in various markets as well variations in costs including feed, water and transport. The risk analysis should also consider the short and longer term viability of the enterprise if various scenarios should occur such as disease outbreaks, constraints on water supply because of droughts, extreme flood events, variable interest rates or domestic or overseas market constraints.

One of the most common reasons for business failure is the failure to recognise and plan for expenses such as professional fees and taxes. It is recommended that advice be sought from the accountant/business adviser on estimates to cover legal, accounting, insurance and taxes that may be incurred by the business.

Case Study: Prawn Farms

The Rural Industry Handbook developed by Rural Industries Research & Development Corporation (RIRDC) indicated that most prawn growers' costs of production, excluding processing and marketing costs, depreciation and financing ranged are between \$7.50 and \$9.00/kg, depending on the scale of the operation. The split in production cost could be expected to be in the vicinity of those below.

Percentage costs of production

Prawn feed	37.0%
Wages and Salaries	25.6%
Electricity	6.6%
Larvae (stock)	10.1%
Fertiliser & chemicals	1.5%
Repairs & maintenance	10.2%
Freight costs	3.4%
Licences & administration	3.0%
Miscellaneous	2.6%

Assuming an average production cost per kg is \$8.27, and an average production/ha/year was 5000 kg, the average processing/marketing costs/kg \$2.12 and the average sale price was \$14.50, the gross profit/ha on an average production would be \$31,150 (42.9%), with a net profit of \$20,000/ha/year or 27.5% excluding depreciation and borrowing costs.

The RIRDC estimate that to develop a farm fully with all appropriate equipment, ponds, buildings, including processing facilities would cost anywhere between \$20,000 and \$60,000/ha (pond), not including land costs. These costs vary with site selection and depend on proximity to local infrastructure, site topography, vegetation and seawater access. The major cost would be the installation of an electricity network through the farm.

The RIRDC considered that it is difficult to nominate the optimum sized operation, but family-operated farms of 10-20 ha can be very profitable, with corporate operations looking for operations greater than 50 ha to become economical.

Most growers develop their own processing facilities and distribute their own product. The RIRDC considered that the industry would be better served by having co-operative regional processing plants, or by integrating with the capture-industry processors. Average processing and marketing costs range between \$1.39 and \$2.50/kg.

Prices vary widely because of market demand, exchange rates, and the form and quality of the product. However, as a guide, black tiger prawns sold (ex farm-gate) for \$11.00-15.50/kg (average \$13.41) in 1995-96 on Australian markets, while kuruma prawns sold (landed live in Tokyo) for \$50 to 150/kg. The average price for kuruma prawns dropped from \$84.50 in 1994-95 to \$70.70 in 1995-96 because of the strengthening Australian dollar against the yen.

7. Planning for continued success

Business planning doesn't stop once the business has been established. The Business Plan needs to be checked from time to time to ensure the marketing, production and financial strategies remain internally consistent and supportive of each other. The implementation of the plan should be monitored using production, sales, cost and other information to keep track of how the business is progressing and whether the goals are being met.

7.1 Potential threats to the long term success

A number of studies have been undertaken in the US to identify why some aquaculture enterprises succeed and others do not. While the situation in the US is not the same as NSW, the results of the studies are of interest.

The most important factors identified for continued successful operation of aquaculture farms include the recognition that:

- (a) aquaculture requires continued and constant commitment
- (b) fish are living animals that need to be "nurtured" like other animals
- (c) good reliable workers and managers with business skills are critical
- (d) it is better to start small while learning or when changing species/ technology/ equipment (eg pilot stage to test new approaches)
- (e) it is better to grow a high value product than to deal in the high volume market
- (f) reliable good quality service is key
- (g) marketing is where the money is made
- (h) it is critical to always manage the enterprise recognising that aquaculture can be a risky business.

The key causes of failures include:

- 6. For family operations, the death of the key person (who understood how to operate the farm) or marital/divorce problems or attempting to support too many family members especially during start up times
- 7. Natural disasters such as flood, hurricane, extreme heat or cold
- 8. Speculation without proper research to identify realistic returns and /or tax minimisation driven investment decisions
- 9. Over-dependence on collateral (especially when interest fluctuations) or inappropriate loan structure
- 10. Poor production management
- 11. Poor management of the marketing / lack of flexible marketing program to deal with changing markets
- 12. Poor monitoring or record keeping of the production, financial and / or marketing aspects
- 13. Appropriate/adequate information not used for decision making
- 14. Poor money and time management with extensive effort spent on non-productive and non-profitable activities at the expense of profitable, productive activities. (80 – 20 rule)
- 15. Poor "business" skills (Note: the failure rate for aquaculture farms is similar to non-farm businesses where 60% fail in the first 5 years).

7.2 Ongoing business planning

The business plan should be a living document, which is revisited and updated especially when major events or changes occur. It is good practice to formally review the plan on a regular cycle. Issues that need consideration in the review include the following:-

Review past performance

The production yields and cost, quality and any other defined performance variables should be reviewed. The same applies to marketing and financial performance measures. It is then possible to compare actual with planned performance and make any necessary adjustments to the strategies.

Analyse strengths and weaknesses

In reviewing the past performance, it is wise not only to monitor the performance of the farm, but also be aware of what other growers are doing and how they are performing. Comparing the performance of the enterprise with others (quantity as well as quality and costs of production) will give some indication as to how the farm is performing relatively – a benchmarking approach. NSW Fisheries information may be valuable in this exercise.

Look for opportunities and threats

It is important to be aware of changes in the markets and the potential for competition from within the region as well as interstate and overseas. Other changes in value adding, harvest size, transport, technology, species, species management, interest rates, etc may offer opportunities as well as threats.

Adjust the plan as necessary

There is nothing wrong with making changes to a Business Plan as threats appear and opportunities evolve. Business planning is an attempt to be systematic about guiding the direction of the business. It also provides the basis upon which to recognise and make the most of opportunities that may not have been envisaged in the original business plan.

8. Information sources

There are many publications available to assist with preparing a business plan. Assistance can be accessed from NSW Fisheries, Department of State and Regional Development, the Northern Rivers Regional Development Board and other Regional Development Boards, industry associations, chamber of commerce, business advisers or accountants. In addition the Internet is a useful source of overseas and interstate information on aquaculture management and business planning in general.

NSW Fisheries

The Aquaculture Divisions at the Port Stephens and Grafton NSW Fisheries Research Stations are key sources of the latest information on aquaculture species and management techniques – critical input in the business plan. In addition NSW Fisheries have useful information on their web site www.fisheries.nsw.gov.au on the latest research and publications which may be of assistance.

Aquaculture Division Port Stephens Fisheries Research Centre Private Bag 1, Nelson Bay 2315 02 4982 1311	Aquaculture Division Grafton Fisheries Research Centre PMB 3 Grafton 2460 02 6644 7633
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Sydney Fish Market

The Sydney Fish Market holds the largest seafood auction in Australia every weekday morning from 5.30am selling 1000 crates every hour and 65 tonnes of fresh catch daily. The Market sells on behalf of fishermen, aquaculture growers and seafood suppliers. While the majority of produce is sold through the Dutch Clock Auction a traditional voice auction is used for live crustaceans. The Sydney Fish Market provides details of the daily market price on its web site www.sydneyfishmarket.com.au. The Sydney Fish Market is developing an Internet sales facility, specifically to meet the needs of aquaculture farmers who are interested in trialing the concept. The Fish Market considers that advantages for the aquaculturist would include listing products on Sydney Fish Market's Internet sales web site, using the Sydney Fish Market as a Sydney delivery depot with payment guaranteed by Sydney Fish Market on the Friday following the week of sale.

Seafood Services Australia

A recent joint national industry / government initiative has been the formation of Seafood Services Australia. This organisation combines all the services previously provided by the Australian Seafood Extension & Advisory Service (AUSEAS), the National Seafood Centre (NSC) and Seaqual Australia under the one 'umbrella' name and in one location. As a result, Seafood Services Australia now provides three core services to the Australian seafood industry:

- Information and advice on technical issues
- Guidance on food safety, quality management and standards
- Assistance with adding value to your business through developing new products and processes.

One of the aims of Seafood Services Australia's is to support commercially focussed, value-adding projects that can stimulate industry development and subsequent production activities. The priority is to add value to fish and fish

products through:

- Planning, funding and managing short-term market-focussed applied research and development with the potential for high return; and
- Keeping the Australian seafood industry aware of opportunities and technical developments through promotion of research and development results and fostering collaboration between industry and R&D agencies.

The Australian Seafood Industry Quality Assurance (QA) Project has produced easy-to-follow Best Practice Manuals for five seafood sectors: farmed prawns, wild-caught prawns, mullet, spanner crabs and reef fish. The ISO Best Practice Manuals, developed under the Australian Seafood Industry Quality Assurance Project can assist in achieving the internationally recognised ISO Quality Standards. The manuals are designed to assist in implementing a Hazard Analysis Critical Control Point (HACCP) based quality assurance system for business, a necessary prerequisite to having the QA system certified to an international standard such as ISO9002.

For further information contact:	Seafood Services Australia, Centre for Food Technology, 19 Hercules Street, Hamilton Qld 4007 Phone: 07 3406 8595 Fax: 07 3406 8677 Web Site: www.dpi.qld.gov.au/cft/ssaustr
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Aquaculture Co-operative Research Centre (Aquaculture CRC)

The Aquaculture CRC (formed in 1994) is a collaborative venture bringing together researchers from universities, CSIRO, State Governments and industry to undertake research into the development and management of aquaculture. The CRC has been focusing on issues such as genetics, breeding, rearing, feeding, disease, product quality and water quality issues and has developed a computer program *Pondman 2* which can be used to manage individual prawn ponds as well as the whole prawn farm including stocking, feeding and harvest scheduling.

For further information contact:	Dr Peter Montague, Aquaculture CRC Director, phone 02 9514 1385
	Dr Peter Rothlisberg, CSIRO Marine Science 233 Middle St Cleveland, Qld 4163, Phone 07 3826 7200.

Northern Rivers Regional Development Board

The Northern Rivers Regional Development Board role is to identify and develop sustainable economic growth in the north east sector of NSW through building on achievements in the area and by adapting or reacting to a dynamic economic environment. The Board through its various projects including aquaculture development, supports the emerging industry needs across the region. The Board can be contacted at PO Box 581, Ballina NSW 2478 Telephone (02) 6686 3008, Facsimile (02) 6686 3508 Email nrrdb@tropicalnsw.com.au

Queensland Department of Primary Industries

An Aquaculture Market Monitor is located on the Department of Primary Industries (DPI) web site www.dpi.qld.gov.au and includes market prices, conditions and commentary of aquaculture products in Sydney and at the Sydney Fish market auction. The DPI also has developed two economic models for the guidance of barramundi or redclaw farmers. Titled "*Barraprofit*" and "*Redclawprofit*", the CD-ROMs are available from DPI. '*Barraprofit*' is an interactive CD Rom package for potential investors and existing producers in barramundi farming. '*Barraprofit*' aims to provide an economic based decision tool package to help potential investors in barramundi aquaculture understand the economic requirements, such as capital investment and operating costs, and the risks involved in farming barramundi, such as the impacts of disease, water quality, feed conversion and markets. It will aid existing farmers to develop their own farm model and apply it to the farm's operation. Farmers can observe the impact on profitability of price changes for inputs such as feed, fingerlings, electricity, packaging and transport. It can also be used to evaluate improvements in genetics and other methods of stock improvement, evaluate future development of farms, such as the addition of ponds, or change in production style. The whole farm model incorporates information on services offered by the Australian Barramundi Farmers Association (ABFA) and supports the growth of the industry in Australia.

Fisheries Victoria

Generic software packages such as *AQUAFarmer* produced by Fisheries Victoria provides a useful framework for financial feasibility assessment. Of particular use in financial assessment is a robust methodology for determining capital and operating costs (including relevant depreciation) and sensitivity analysis associated with variable growth rates and economies of scale. The Fisheries Victoria have other useful information at www.nre.vic.gov.au/fishing/aqua.

National Fishing Industry Education Centre

The National Fishing Industry Education Centre (NFIEC) located in Grafton provides a number of tools which may be of assistance in establishing aquaculture enterprises. The NFIEC is an alliance between TAFE NSW and the Australian Fishing Industry. The Australian Fishing Industry has recognised the need for more systematic training for its workforce including those involved in the growing, processing and marketing of aquatic plants and animals. The NFIEC is committed to providing relevant, credible and accessible vocational education and training by face to face and flexible delivery, focusing of learners' needs. The Centre's courses include modules on farm design and construction, feeding, stocking and sampling, health management and water quality management.

National Fishing Industry Education Centre
Locked Bag 5
Grafton, NSW 2460
Australia
Phone: (02) 6644 7353 Fax: (02) 6644 7767
Web site: www.natfish.tafensw.edu.au

Professional and trade sources

Equipment suppliers can also be a useful source of information on the latest in technology. Professional associations will also have helpful general information on the planning and operating a successful aquaculture enterprise.

NSW AQUACULTURE ASSOCIATIONS

Industry associations can be a very useful source information on the aquaculture industry in Australia. By becoming an active member of these associations, growers benefit from the shared experience of other members and information disseminated by them.

Table 5. NSW Aquaculture Associations

Association	Contact Details	Function / Mission Statement
Australian Prawn Farmers Association PO Box 3128 SOUTH BRISBANE Qld 4101	Col Price, President Martin Breen, Exec Officer Phone: (07) 3255 1070 Fax: (07) 3844 7307 Mobile: 0417 006 639	Members: 60 To represent the interests of the Australian prawn farming industry.
Australian Freshwater Crayfish Growers Association Inc NSW Division 51 Corangula Road CORANGULA NSW 2440	Stewart Sullivan, President Phone: (02) 6561 7337 Fax: (02) 6561 7447 Mobile: 0417 474 417 Janice Bruem, Secretary PO Box 104 WAUCHOPE NSW 2446 Phone: (02) 6585 6441 Fax: (02) 6585 6092	Members: 17 To protect and promote the interests of growers by keeping abreast of the latest developments in the industry; ensuring high standards are maintained; liaising with government and regulatory authorities; and holding meetings to discuss matters of mutual concern that will help growers to optimise returns and industry growth.
NSW Aquaculture Association Inc PO Box 3 KARUAH NSW 2324	Rob McCormack, President Brian Leader, Secretary Phone: (02) 4997 3002 Fax: (02) 9688 4645 <i>yabby@bmr.com.au</i>	Members: 95 To promote, develop and improve freshwater aquaculture in NSW and Australia.
Gilgandra Aquaculture Association Inc "Havilah" GILGANDRA NSW 2827	Ken Bardon, President Phone: (02) 6848 3526 Fax: (02) 6848 3555 John Jenkins, Secretary Phone: (02) 6848 5314	Members: 3 To develop aquaculture in the Gilgandra and surrounding regions.
Jervis Bay Mariculture Association Inc 83 Attunga Ave KIAMA HEIGHTS NSW 2533	Barrie Bamford, Secretary Phone/ Fax: (02) 4233 1988	Members: 10 Lobby for the development and establishment of shellfish farming in Jervis Bay, NSW.
Murray Region Aquaculture Association Dunoon RMB 4030, Howlong NSW 2643	Paul Trevethan - President Phone: (02) 6021 0120 <i>MRAA@bigpond.com</i> Maureen Rutherford, Secretary 1 Pibara Place ALBURY NSW 2640 Phone: (02) 6026 5276 Fax: (02) 6026 5177	Members: 98 To promote aquaculture in the Murray Region.
NSW Cultured Mussel Growers Association PO Box 673 EDEN NSW 2551	Peter Higgins, President Phone/Fax: (02) 6496 3039 Carl Possel, Secretary Phone/Fax: (02) 6495 1288 Peter Morris, Consultant Phone: (02) 6495 9872	Members: 12 To promote sustainable mussel farming, and lobby government for a viable mussel industry in NSW.

Association	Contact Details	Function / Mission Statement
<p>NSW Farmers Association (Oyster Section) GPO Box 1068 SYDNEY NSW 1041</p>	<p>Robert Bailey, President Brad Williams, Exec Officer Phone: (02) 9251 1700 Fax: (02) 9221 6913</p>	<p>Members: 220 To represent the NSW oyster farming industry.</p>
<p>Oyster Farmers' Association of NSW Ltd PO Box 254 TURRAMURRA NSW 2074</p>	<p>Roger Clarke, President Lesley Spencer, Manager Phone: (02) 9487 3566 Fax: (02) 9487 1849 <i>oyster@oysterfarmers.asn.au</i> <i>http://www.oysterfarmers.asn.au</i></p>	<p>Members: 175 To represent the interests of the NSW oyster farmers.</p>
<p>NSW Silver Perch Growers Association Inc "Koorani" Inverell Road BUNDARRA NSW 2359</p>	<p>Bruce Rhoades - President Phone (02) 6723 3357 Fax (02) 6723 3230 Sam Clift, Secretary "Boori" Boori Road CURLEWIS NSW 2381 Phone: (02) 6747 4880 Fax: (02) 6747 4793</p>	<p>Members: 100 Network with government and industry bodies on behalf of members to gain information, technical expertise, training, funding and infrastructure; provide an initial point of contact for intending growers; increase public awareness of silver perch.</p>
<p>Native Fish Growers Co-op Ltd PO Box 244 GLOUCESTER NSW 2422</p>	<p>Lindsay Fraser - President Phone/Fax(02) 6558 7571 Marcia Thompson - Secretary Phone/Fax(02) 6558 8321</p>	<p>Members: 14 To facilitate the collection of information; to share ideas and labour for on-farm operations, and coordinate the development of a viable, sustainable industry in the local area.</p>
<p>Pet Industry Joint Advisory Council of Australia Ltd Suite 4, 39 Darcy Road WENTWORTHVILLE NSW 2145</p>	<p>Bob Biggs - President Ian Mustchin - Exec Director Phone: (02) 9896 2899 Fax: (02) 9896 3521 <i>pjac@fast.net.au</i></p>	<p>Members: 500 To create an environment that grows the commercial pet industry by fostering responsible supply, care, sale and ownership of companion animals (representativeness includes the aquarium sector of the aquaculture industry). Specifically, to achieve a strong positive public perception; speak influentially and credibly for the industry; promote high standards within the industry; build and maintain a strong financial base; protect industry; communicate effectively.</p>

Reference Sources

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NOFARIC 1995 *Marketing silver perch (Bidyanus bidyanus)*. Prepared by Ruello & Associates, NOFARIC, Sydney, Australia.

NOFARIC 1995 *A model of a feasibility study and business plan for aquaculture*. Prepared by the Pacific Seafood Management Consulting Group Pty. Ltd., NOFARIC, Sydney, Australia.

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NSW Fisheries 1999 *Silver Perch Market Assessment*. Prepared by Ruello & Associates. Sydney, Australia.