

Northeastern Regional Aquaculture Center

University of Massachusetts
Dartmouth
North Dartmouth
Massachusetts 02747

Business Planning For Aquaculture -Is It Feasible?

*Dan B. Strombom Rutgers Cooperative Extension of Cape May County
Stewart M. Tweed New Jersey Sea Grant Marine Advisory Service*

Introduction

You have read newspaper or magazine articles persuasively claim that aquaculture has a bright future. The technology, growth process, challenges and potential rewards are exciting. At the same time, however, remember that aquaculture is a demanding and relatively risky business.

So, before you take one more step, sign the Aquaculture Business Planning Pledge:

I solemnly swear to assess thoroughly and honestly the complete organization of my aquaculture enterprise and write it down as a business plan.

Signature

Date

Inadequate preparation of a business plan will hurt in two very fundamental ways. First starting in aquaculture without a good business plan will result in mistakes which could have been anticipated and solved on paper. A written business plan exposes thoughts, assumptions and research findings to reason. Can it really work? What resources do I need now and in the future? Only by writing down the answers to these and other questions can you minimize the risks.

Second, without a business plan finance sources will be limited to those few who have unquestioning faith in you. Investors, public or private, will insist on seeing exactly why they should back you. Despite arguments about the grand potential of aquaculture, you must show in detail how invested money will be used and return a satisfactory profit to investors. You will be competing with many other projects and aquaculture is not familiar to many investors. A demonstration that your enterprise is founded on solid reasoning is an important advantage.

Writing a business plan is not easy. Expect to devote months, not weeks, of disciplined effort. Short-circuiting the steps required, by taking a cookbook approach or by being incomplete, will only reduce chances for success. There will be frustration but the experience can be extremely rewarding. The business plan is your future on paper, and a mechanism for testing dreams against expected challenges and opportunities.

The numerous facts and figures needed to complete a business plan can be confusing unless you are organized. This fact sheet provides a structured planning process. It identifies information essential to develop a realistic description of the proposed venture.

There are many ways aquaculture can be practiced and each individual will face different challenges. This fact sheet is meant to be generally applicable. You must explore the full implications of the questions to obtain the information your plan will require. Additional questions specific to your enterprise will emerge. Completion of this fact sheet will provide a good sense of how to pursue a successful aquaculture venture and a formal business plan.

A Suggested Approach

As you contemplate, develop, and finalize your responses to the questions below, try to maintain a dialogue with yourself. The purpose is to convince yourself that your goal is reasonable and achievable. If you do not believe in your venture, do not expect others to back you.

To assess progress regularly challenge yourself. Is this true? What are the alternatives? Is this consistent with other decisions?

Accept what others assert only after thorough examination. What are their credentials? Can someone verify this? Be critical and you will be well prepared.

BASICS STRUCTURE

It has been said that farmers must possess more skills than should be reasonably expected of anyone. This is also true for Aquaculturists! You will repair equipment, process and market products, keep books, hire and fire, arrange financing, and carefully watch over stocks of fish or shellfish, to name just a few tasks. All of these responsibilities are overshadowed by three fundamental concerns:

1. Who will buy the product?
2. How will you produce the product?
3. Will revenues adequately exceed costs?

This fact sheet has sections devoted to these concerns, each accompanied by a pull-out worksheet. Make several photocopies of the pull-outs so that answers can be modified as you gain insight. Save a blank copy for the final draft,

SOURCES OF INFORMATION

Perhaps the best sources of information are extension professionals. They are trained to disseminate aquaculture information effectively and have close contacts with industry, university researchers and government regulatory agencies. A few states also maintain government offices to assist Aquaculturists.

National, regional and state aquaculture associations exist. Consider becoming an active member to one or more. Visit several aquaculture operations similar to the venture you are contemplating to get a feel for day-to-day operations. Stay abreast of the industry by subscribing to aquaculture magazines or newsletters.

Professional associations and firms affiliated with aquaculture, such as equipment suppliers and restaurant owners can be excellent sources of information on business trends current costs and market data.

Finally, visit local chambers of commerce, economic development offices, planing boards, and banks for information on economic development programs and zoning.

SECTION I: EXPECTATIONS

Every business owner wants success, but everyone has a unique definition of success resulting from individual experiences, prospects, and goals. Only you can decide what is to be achieved by your aquaculture venture.

It is useful to establish expectations before developing a plan. This helps to avoid the natural, stubborn tendency to forge ahead even though major undesirable compromises will result.

A clear understanding of your enterprise goals will guide decisions throughout the planning process. For example, an aquaculture business meant to generate an annual income of \$40,000 will be different from one expected to yield \$140,000 per year.

Besides ensuring that expectations accurately reflect needs, be forthright in assessing how long you are able to

wait for rewards. Aquaculture production cycles are longer than in other types of businesses. It will take months, and in most cases several years, before revenues are generated.

SECTION II: MARKETING

All investments made in your aquaculture enterprise — dollars, time, and personal energy — will go down the drain if you cannot find and keep customers. Finding customers requires analyzing potential markets to determine who is willing and able to pay for the product(s). This is the objective of the marketing worksheet.

Market Analysis

A. Determine Market Area

A practical way to analyze potential markets is to define a serviceable geographic area. Whether you are delivering a product or expect to attract customers as in a fee fishing operation travel distance and time are major considerations.

A one-person operation for example, might be hard-pressed to allocate even a couple of hours per day for deliveries. An enterprise with a partner or employee responsible for deliveries could market to a wider area. A rule of thumb derived from farm markets is that the majority of customers for on-site sales will come from a ten-mile radius of your location.

B. Identify Market Segments

Within a market area there will be different types of customers. You must determine if there are enough potential buyers of your product to support your business.

The principal customer types (“market segments”) for aquaculture products are: wholesalers, restaurants, seafood stores, supermarkets and consumers buying directly. Other customer types might include sports fishermen at fee fishing operations institutional buyers, pet stores for ornamental fish and bait dealers. You must determine which segment(s) you are going to serve.

C. Research Buyers? Needs

Fish and shellfish markets are dynamic seasonal variability and industry trends are important considerations that affect buyer’s needs and expectations. Each market segment has its own buying patterns, based on quantities purchased product forms price, and delivery. Talk to as many different buyers as possible to obtain a representative picture of their needs.

Some aquaculture products have well-established markets while others face uncertain markets. A visit to a seafood wholesaler will yield more useful information on oysters than on tilapia.

If the required information is not available from your market area two alternative approaches can be helpful. First talk to Aquaculturists and buyers in regions where

the product is being sold. Second identify a substitute product which is sold locally and inquire about its market. For example, if you want to market tilapia a substitute fish for calculations might be flounder because both are mild-flavored, white-fleshed, and relatively expensive.

D. Estimate Area Market Potential

After obtaining a picture of buyer's needs, market potential can be estimated by extrapolating information to the number of buyers within your area. Chambers of commerce, yellow pages of the phone directory, or local economic development offices can be useful sources of business and consumer census data that can help to identify and describe a market.

E. Conclusions

Market analysis may show that your plan has promise — there are enough potential customers — or that the plan will not work. Perhaps you intended to sell whole fish to restaurants and seafood retailers, but found that they want headed and gutted fish. This means more labor and waste disposal, but, possibly, a higher price per pound. You can adjust the plan or scrap it — either way, you have avoided an expensive mistake.

SECTION III: PRODUCTION FEASIBILITY

After determining the practical and market feasibility of your operation, you should examine its production feasibility. The critical question is: “can I efficiently and economically produce my proposed aquaculture product?”

Many approaches are used to select a culture species. A species maybe chosen because it is in short supply, a lucrative market exists or it is easily cultured. Successful production requires as much knowledge as possible about its biological and production requirements.

After considering the culture species and systems, you may determine that permitting, construction, seed and feeding costs at your site will exceed the potential production income. This information will save you money, time, and frustration. This section and accompanying worksheet will help identify problems that limit operational success.

Getting Started

The first step in developing a successful aquaculture production facility is to obtain and critically evaluate the scientific information on the chosen species. Information sources have been discussed in the introduction to this publication.

A personal assessment of your contributions to the project is the basis for identifying needs. What land, facilities equipment training, etc. do you possess? The more tools and experience that you bring to the project the greater the chance of success.

Each species has an unique set of biological factors that influence its culture potential. Water quality, predation, and disease problems should be anticipated but growth variations, food conversion rates and other factors can make or break an operation. Considerable technical information is available from extension specialists and published materials.

Carefully consider site selection. Site selection can be a major determinant of culture success and production rests. Preparing or modifying a site to meet your needs can be a costly undertaking. Federal and State regulations, and local regulations or customs may also be limiting factors at a proposed location.

Fixed and Variable Costs

Business managers often distinguish between fixed costs and variable costs of production. Fixed costs are associated with those inputs which do not change over the short run such as salaries, overhead, insurance and depreciation (capital expenses). Variable costs are dependent on level of production and will change as you increase or decrease your stock. They include juveniles, feed, chemicals, labor, electricity, etc. Operational expenses and potential profitability for alternative culture systems and scales of operation can be calculated by examining these two kinds of costs.

Inputs

Stock (seed fingerlings, etc.), feed, and labor costs are the most expensive variable costs of a culture operation. It is important to analyze these costs carefully to ensure they are accurate and manageable.

Production is limited by the number of organisms stocked. Stocking rates unit costs growth and potential mortality of culture organisms should be available in the resource materials. These values can be evaluated to determine profitability if higher than expected seed prices or mortalities are encountered.

Feeds

Most fish production systems require supplemental feeding. Because of the volume and price of feeds, the equipment needed and the labor require& feeds and feeding are costly — up to 40-50 percent of total variable costs. Thus, profitability is often determined by the feeding efficiency.

Amount of feed required is determined by feed conversion rates and can be estimated from formulas such as those in the University of Maryland Fact Sheet “Figuring Production Costs in Finish Aquaculture” or tables provided by feed manufacturers. If food information is not available for your species or geographic area formulate estimates from similar species and areas.

Consideration should be given to projections of changing feed costs. How have nutrition, price of ingre-

clients and feed costs changed in recent years? Are bulk purchase and storage available? This information will help you anticipate actual feed costs.

Management

Management of an aquaculture facility often requires more time and expertise than traditional farming activities. Ability to make quick management decisions and take prompt action is crucial, particularly when stocking, feeding and harvesting fish. Estimate your needs based on experience, from discussions with other growers, or from technical studies. Determine if you have the necessary knowledge, skills, time and labor. If periods of critical decision making conflict with other activities can you hire the necessary assistance? Include realistic estimates of your availability and costs, including resources or the cost to obtain them.

Experience is the best teacher. Successful culturists minimize operational costs by carefully observing changes in feeding habits, water quality, disease and predation. They anticipate and correct problems before losses occur. Learn as much as possible from these growers and incorporate their experiences into your planning.

Be flexible in your estimates. Market demands, biological problems, and culture conditions will alter planned production. It is useful to develop three sets of projections based on high, intermediate, and low potential production. As you gain experience in aquaculture you will be able to anticipate trends or problems and adapt more effectively. In the beginning it is best to recognize the inherent unpredictability of aquaculture and understand how to modify your plans as needed.

SECTION IV: FINANCIAL FEASIBILITY

Completion of the previous worksheets is equivalent to gathering pieces of a jigsaw puzzle into groups of the same color. In this final section the overall picture of your business will emerge by constructing a cash flow statement.

Importance of Cash Flow Statement

The cash flow statement is the most important of several financial documents included in a formal business plan. It is a tool for forecasting profits and ensuring that money is available when needed. A business can fail even if it is profitable. If profit comes in after creditors have closed your door, it will be too late.

The cash flow statement shows how much money you need, and when you need it; how much money you are bringing in and when it is available. This is essential information because aquaculture production is often discontinuous. Fish and shellfish take months to grow to market size, and during this time expenses will be incurred. Knowing in advance that a cash gap will occur allows you to budget for it. Cash flow projections also include timing

of capital investments, putting idle cash to work and lessening dependence on debt. Interest payments may be minimized by borrowing as needed rather than annually or sporadically.

Basic Structure

Cash flow projections should extend three years or to a point where the operation is consistently in the black whichever is longer. In hard clam culture, for example, revenues do not arrive until year two or three and profitability may not be achieved for another year or two. In this case, financial plans should be projected to at least year five.

The cash flow statement begins with the cash on hand the day you start business. Do not begin when your operation is stocked as you will be spending money long before this time. To the initial balance, receipts are added and disbursements are subtracted for a prescribed time period. The end balance then becomes the start balance for the next time period.

Some Missing Pieces

In planning the operation start-up, you will not know the beginning balance. This must be determined based on your anticipated financial needs. Therefore, the first step in completing the worksheet is to calculate net and cumulative cash flows for each time period within one year. Net cash flow is the difference between cash receipts and cash disbursements for the period. Cumulative cash flow is the sum of net cash flows from the starting period to the current period.

One essential item not initially available is any loan repayment expense because you will not know how much must be borrowed. An adjustment for this will be made after all other financial needs have been estimated. By adding the time period interest charges and the repayment amount for each time period the amount needed to start up and operate an enterprise until revenues arrive can be estimated. Your bank can provide tables of interest charges and repayment schedules for varying loan amounts and rates.

As you work through the projections, keep in mind that only actual cash flows are recorded. Sales on credit made in one period but collected later are not entered until the cash materializes. Any prepayment of expenses such as insurance is recorded in full when the payment occurs. Depreciation is a non-cash expense and does not enter the computations of cash flow (except for tax implications at the end of the year).

Monthly time periods are used for the first year cash flow statement. In subsequent years, quarterly projections may be sufficient. You must decide the appropriate level of detail. In some operation cash expenses and receipts occur in spurts, a flurry of activity associated with stocking, another intense period at harvest, and a lull in between. Shellfish aquaculture might fit this model. For such cases you might choose six month intervals for the inactive periods and monthly estimates for busy times.

Most information needed to complete the cash flow statement can be found in the previous worksheets. The expense categories listed are common to most aquaculture, but be sure that items peculiar to your operation are included. Some estimates will require making reasonable assumptions and minor calculations.

Two items in the financial projections require careful thought. The first is estimating revenues; seasonal variability in price and quantities harvested can complicate this calculation. Second feed expenses will vary with changes in diet as fish grow, feed conversion rates, biomass (number times average weight), and feed price.

Consult financial advisors to estimate expenses for legal, accounting, insurance, and payroll taxes and benefits. To estimate equipment repair and advertising costs, speak to knowledgeable industry sources such as equipment suppliers and other aquaculturists.

Access to a computer spreadsheet program will aid in development of a cash flow statement because corrections and changes in assumptions are much easier to make than with pencil and paper.

CONCLUSION

If the accompanying worksheets have convinced you that an aquaculture venture can meet your personal and financial goals, it is time to set out an action plan. This plan should use the accumulated information. In most cases, the first step will be to arrange for financing.

Outside financing may be available as a loan (debt) or in return for giving up some ownership of the business (equity). Either type of funding or a combination of both should be carefully decided after consulting a trusted accountant and lawyer. Major factors which will affect your options include how much money is required your credit history, the lending "climate" and your legal responsibilities.

Compared to many businesses, aquaculture is viewed as a risky enterprise by financiers. Do not become disheartened. It is much more common to find financing after being turned down by several investors than to be successful on the first attempt.

After gauging personal financial and other contributions to the venture, most entrepreneurs turn to people they know for a loan. Such arrangements are easier to arrange and terms can be better than commercial interest rates. Be aware, however, that tensions can affect the relationship especially if the business falls on hard times. It is important for tax and other legal reasons that all agreements are written down in detail and signed by all parties.

Additional sources of financing include private investors, banks, and government funding programs, and each has different perspectives, requirements and expectations. Looking at your venture from the viewpoint of potential financiers will help prioritize the search for funds and identify the most likely sources.

If you approach private investors or financial institutions, it will be necessary to prepare a formal business plan. There are a number of excellent published guides to the proper format and content of such a financial proposal. Several are listed at the end of this publication.

Once your aquaculture operation is established, make planning a high priority. There will be new markets to develop, improved culture methods to assess and use, and the need to manage business growth. Your plan should evolve with changing conditions, but always ensure that the core goals remain as the primary measure for your efforts.

USEFUL REFERENCES

Allen, P.G., L.W. Botsford, A.M. Schur, and W.E. Johnston. 1984. *Bioeconomics of Aquaculture*. Elsevier. New York NY. 351 pp.

Bangs, D. 1989. *Business Planning Guide: Creating a Plan for Success in Your Own Business*. Upstart Publishing Co., Inc. Dover, NH. 143 pp.

Cato, J.C. (cd.) and ten others. 1991. *Investing in Commercial Hard Clam Culture: A Comprehensive Guide to the South Atlantic States*. Florida Sea Grant Program, Report Number 104 (SGR-104), 128 pp.

Chaston I. 1983. *Marketing in Fisheries and Aquaculture*. Osprey Books Huntington NY. 143 pp.

Chaston, I. 1984. *Business Management in Fisheries and Aquaculture*. Osprey Books, Huntington, NY. 130 pp.

Joint Subcommittee on Aquaculture and National Agricultural library. 1992. *Aquaculture: A Guide to Federal Government Programs*. National Agricultural Library, Beltsville, MD. 38 pp.

Kevgor Aquasystems. 1989. *Starting an Aquaculture Business*. P.O. Box 48851, Vancouver V7X1A8, Canada. 60 pp.

Lipton D. & R. Harrell. 1990. *Figuring Production Costs in Finfish Aquaculture*. University of Maryland Cooperative Extension Service. 7 pp.

Meade, J. 1989. *Aquaculture Management*. Van Nostrand Reinhold NY. 175 pp.

Acknowledgements

This work was supported by the Northeastern Regional Aquaculture Center through grants number 89-38500-4356 and 90-38500-5211 from the Cooperative State Research Service, U.S. Department of Agriculture. Any opinions, findings, or recommendations expressed in this paper are those of the authors and do not necessarily reflect the views of the U.S. Department of Agriculture.

Worksheet I: EXPECTATIONS

A. Which type(s) of aquaculture interest you?

1. Species
2. Production method

B. Describe your product(s):

1. Product form (live, fresh, fillets, smoked, etc.)
2. How marketed (wholesale, retail, etc.)
3. What makes your product desirable?
 - a. To produce
 - b. To market

C. How will the business be organized?

1. Sole proprietorship
2. Partnership (What will partners contribute?)
3. Corporation
4. Other

D. Why will you be successful?

1. Who will buy your product?
2. What will set you apart from existing or future competition?
3. What skills and abilities will make you successful?

E. How much money do you expect to make:

1. What can you survive on?

2. What would be a comfortable amount?

3. How much would you really like to make?

F. How much money can you afford to invest?

G. How will the venture affect your family?

1. Are they willing to relocate?

2. Are they willing to live on reduced income? For how long?

3. Will they support you in taking the risk?

4. Will family members work in the business?

H. What impact will the new venture have on your present job?

1. Provide supplementary income

2. Replace current job

I. How long do you expect it will take for the venture to

1. become operational?

2. become profitable?

3. achieve your financial goals?

Worksheet II: MARKETING FEASIBILITY

A. Market Area

1. Determine time available for deliveries (Consider time required to harvest, process, box, ice, etc.):

Hours _____

2. What is the longest distance you can drive round-trip for deliveries (Assume average speed of 35 mph)?

Miles _____

3. This radius encompasses:

Names of Cities and Towns

Population

B. Market Segments

Within the market area who is buying or potentially might buy a product like yours?

Segment

Number of Current Purchaser

Number of Potential Purchasers

Wholesalers

Restaurants

Seafood stores

Supermarkets

Individuals

Other

C. Buyers' Needs

1. Which product forms are preferred? (Check as many as apply)

☐ Live ☐ Fresh ☐ Frozen ☐ Whole ☐ Headed&Gutted ☐ Fillets/steaks

☐ Other (specify)

2. What is the preferred quantity of each product per unit time? (i.e., Lb/wk)

3. What are seasonal prices for each product form?

List of Products

Your Species

Substitute Species

High

Average Low

High

Average Low

4. Can you provide consistent supplies? If not do buyers see this as a problem?

5. What are the preferred payment practices?

☐ Immediate Credit Terms _____

D. Market Potential

1. What is the average quantity purchased per buyer per year (in pounds, bushels, etc.)?

Segment	<u>Your Product</u>	<u>Substitute Products</u>
---------	---------------------	----------------------------

2. What is the total quantity purchased in the market area per year?

(Average quantity times number of buyers in market segment)

<u>Segment</u>	<u>Your Product</u>	<u>Substitute Products</u>
----------------	---------------------	----------------------------

3. How might general seasonal and long-term market trends affect the price for the product and substitutes?

E. Conclusions

1. Did you modify your original product concept? How?

2. Which are the most attractive market segments? Why?

3. Are there enough buyers in your market segment(s) to purchase the expected production at the appropriate time?

4. What are your market options for:

a. excess production?

b. undersized fish or shellfish?

5. How much will marketing add to production costs?

a. _____ Gutting/Waste disposal

b. _____ Packaging

c. _____ Ice/Cooling

d. _____ Transportation

e. _____ Advertising/Promotion

f. _____ Billing

Worksheet III: PRODUCTION FEASIBILITY

A. Compile information on the culture potential and biological needs of the species.

1. Make a list of your most valuable resource materials (personal contacts, books, etc.) for culture of your species.
2. List permits and regulations that apply to water use, production, harvest or waste disposal activities.

B. Biological Factors

1. What are the water quality requirements of the species? Does your system meet these requirements?

Temperature _____ Alkalinity _____ Dissolved Oxygen _____ Hardness _____
Salinity _____ Ammonia _____ pH _____ Other _____

2. What diseases and predators affect the species?

3. What parameters must be controlled and how will they be controlled?

C. Factors Affecting Profitability

1. How many organisms will you need to stock your system?
2. What percentage of the original stock do you expect to lose?
3. What is the potential yield of your system?
4. How long will it take to produce a marketable product?

5. What could cause losses? (water quality, predation, disease, competition)

6. How and at what cost can losses be controlled?

D. Production Costs

1. What are initial construction or facility costs?

2. List equipment needs by model, quantity and cost for the following culture operations:

Production:

Water Quality Maintenance:

Harvesting:

Storage (product):

Loading and Hauling:

Processing:

Electricity:

3. List and estimate variable costs for the system:

Organisms (stocking rate, price):

Feed (price per lb, yearly need):

Labor (cost to feed, harvest, haul, process, etc.):

Electricity:

E. Emergency Plans:

1. What are production risks?

2. How can these risks be reduced?

3. What will risk reduction methods cost?

Worksheet IV: FINANCIAL FEASIBILITY

Cash Flow Statement, Year One

	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Beginning Cash Balance												
Add: Cash Sales												
Collection of Receivables												
Loans												
Additional Investment												
Total Cash Receipts												
Deduct: Start-up Costs*												
Seed or Juveniles Expense												
Feed												
Chemicals												
On-site Fuel & Oil												
Electricity-Utilities												
Variable Labor												
Advertising												
Insurance												
Legal & Accounting												
Delivery Expense												
Fixed Cash Disbursement**												
Loan Payment												
Mortgage or Rent												
Taxes												
Total Cash Disbursements												
Net Cash Flow												
Cumulative Cash Flow												
Ending Cash Balance												

*start-up costs

Site Development

Buildings

Production Facilities

Equipment

Vehicles

**Fixed Cash Disbursements

Salaries

Payroll Taxes & Benefits

Office Supplies

Boxes

Licenses

Telephone

Miscellaneous

Total per month