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# Aquaculture Small Business Startup Kit

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# Aquaculture Small Business Startup Kit

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## I. Starting a New Aquaculture Venture: Doing Your Homework

In this new era of renewed entrepreneurship and as producers receive less and less of the consumer's dollar, many of you are taking that uncertain but rewarding step toward starting a new venture. Many producers in Indiana are starting specialty food businesses, becoming members of new generation cooperatives, or becoming direct marketers of their products. This publication describes the first steps of starting an aquaculture business. It includes Activity Worksheets at the end of each Section to help you through these steps.

### Research the Industry

What do you know about producing fish? The first step in starting a new aquaculture business is to research the industry. You need a good perspective on the industry, your product's place within the industry, and your potential competitors. Your research should provide you with enough information to do a preliminary analysis of your potential customers and competitors. This research will also give you a good start on your business and marketing plans.

There are many ways to find information to do your preliminary customer and competitor analysis. A good way to find some general information is via the Internet, aquaculture associations, and aquaculture magazines. Aquaculture associations are not only a great way to find information about the industry, but also a wonderful way to meet people who are producing fish. Visiting their establishments can be a great source of insight. The Indiana Aquaculture Association ([www.aquanic.org/iaa/](http://www.aquanic.org/iaa/)) conducts several workshops during the year that you could attend to get information regarding the latest techniques and trends in the industry. You could also contact your local Purdue University Extension educator and the Purdue University Extension Aquaculture specialist who have extensive sources of information.

### Research the Market

Before starting an aquaculture business, you must also determine if there is a market for your product. A market is defined as all the potential buyers of your product. However, consumer interest alone does not make a market. Your potential buyers must not only be interested in buying the product but also have the ability to pay your asking price and have access to your product. You will need to determine how big that market is and what segments of the population make up that market. You will need to take an intimate look at your business and identify the internal and external factors that could be characterized as strengths, weaknesses, opportunities, and threats.

### *Preliminary Product and Consumer Analysis*

To do a preliminary product and consumer analysis, you will need to answer the following questions:

- What hole in the market will my product fill? Understanding this is imperative if you are to turn a profit and have long-term success. An example of a hole in the market would be if there was a demand for a fish product from a growing segment of the population in your area that is not being met by local producers. If you were able to produce and market that product to that target segment, you would be filling the hole in the market.
- How is my product different from existing products in the marketplace? In order for your product to succeed, it must provide something to your target customer that is not being provided by an existing product, such as convenience, quality, price, and/or a feel good factor. A feel-good factor could be a product attribute that makes the customer feel good when he/she buys it, e.g., people might buy fish from a local producer because it makes them feel more connected to where their food is coming from and feel better about themselves for buying from local producers.
- Will I sell my product directly to the end consumer, or will I sell it through a retailer? The answer to this question requires information about the customer. If you are going to sell your product directly to the end consumer, then information about demographics and lifestyle are important. The marketing strategies that you use will be different depending on the customer you want to attract. A fifty-year-old grandmother is a different customer than a thirty-year-old mother. Although, both are women and mothers, their need for certain products is different because their lifestyles are different. It is also important to know how your customers will get information about your product and how customers will purchase the product. In other words, how will you advertise and sell your product?
- How much will it cost to start my business? What are the equipment and raw materials requirements? It is just as important to identify your product's potential suppliers. Again, aquaculture associations and magazines are a great way to find information on who is supplying the inputs for your product and how much those inputs cost. This is a great way to find out some of the preliminary capital costs for your business. These are costs that will come out of your initial investment and that you will not recoup until your business turns a profit.

### *Preliminary Competitor Analysis*

To do a preliminary competitor analysis, you will need to answer the following questions.

- How many businesses are selling the same or a similar product in the market I wish to serve?

- Is there room for more competitors? Especially in a rural area, you want to make sure you know who your potential competitors will be. There is nothing that can stop your business from developing faster than dipping into the pocket of one of your neighbors. If there is room for more competitors, why? Perhaps the market is so large that not all potential customers are being served. If so, you should determine if the businesses already in place are increasing capacity.
- What are my competitors' costs? For example, you should get an idea of how much they are paying for juveniles/fingerlings, feed, transportation, and labor.
- What type of infrastructure (space and utilities) will my business need?
- What types of licenses and permits at the federal, state, and local level will I need?
- What are my competitors' strengths and weaknesses? Take advantage of your competitor's weaknesses. Can you avoid your competitor's pitfalls? What are the strategies pursued by your competitors? Which would you change and which will you integrate into your business. These are some of the questions that you should start to think about during this first stage of business development.

### Suggested Readings

Baker, Gregory A., Orlen Grunewald, and William D. Gorman. *Introduction to Food and Agribusiness Management*. Prentice Hall: Upper Saddle River, New Jersey 2002.

Iowa State University Extension. *Steps to Ag Business Development*.

[WWW.iowaagopportunity.org](http://WWW.iowaagopportunity.org)

Rogak, Lisa. *The Complete Country Business Guide: Everything You Need To Know To Become A Rural Entrepreneur*. Williams Hill Publishing: Grafton, New Hampshire 1999.

Rowe, R. Barbara and Alma J. Owen. "Getting Started" *Working for Yourself*. Purdue University Cooperative Extension Service.

Small Business Administration. *Starting Your Business - Your First Steps*. <http://www.sba.gov>

### Activity Worksheet: Self Assessment

Now that you've done some preliminary research on the industry, you should take the time to evaluate your finances, business goals, and risk tolerance. There are many questions that you should ask yourself before embarking on a new aquaculture venture. How you answer these questions will give you an indication of whether or not you are ready to start this new business.

1. How much are you willing to invest?

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2. Can you afford to **not** make a profit from your aquaculture venture for two or three years?

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3. Will your business require a substantial upfront investment and do you have enough capital to be the sole owner or will you need to find investors?

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4. Do you want to work full-time or part-time?

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5. What are your hopes and aspirations for the business? Where do you see yourself in two years, five years, and ten years? Do you see your business expanding? If so, do you have enough capital and infrastructure to do so?

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6. Can you deal with the stress of starting a new business? How well can you deal with risk? You should ask yourself how much time and financial and emotional investment you want to put into this business and how much are you willing to lose.

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7. Are you prepared to work long, irregular hours and to be on call 24 hours a day?

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These are questions that should give you some insight into how prepared you are for this business venture. Several of the sources listed above in the suggested Readings Section on page 3 have more detailed self-assessment tests.



**Activity Worksheet: Doing Your Homework**

1. Why do you think that this is something you would like to do?

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2. How do you intend to operate this business?

A. Hobby?

B. Part-time (supplemental) job?

C. Full-time career?

3. What kind of labor is available for your business? Indicate whether full-time (FT) or Part-time (PT)

A. Self?

B. Family and friends?

C. Hired hands?

4. What fish species do you want to grow and why?

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5. How much investment do you want to put in this?

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6. How much profit do you expect from your investment?

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7. What type of production systems will you be using?

A. Cage

B. Pond

C. Indoor Tanks

8. Do you have experience growing aquatic animals? If 'No,' do you intend to learn how to grow aquatic animals?

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9. What will be your water source?

A. Well

B. Stream/Creek

C. Rain

10. What market coverage are you considering?

A. Local/County

B. State/Regional

C. National

11. In what form will you sell your products?

A. Live

B. Whole-on-ice

C. Processed

12. How will you get your product to market?

A. On-farm sales

B. Deliver to retailers

C. Sell to Wholesaler/Distributor

## II. An Aquaculture Business – “Good Fit” for me?

Starting a successful aquaculture business requires a lot of thought and time before even a cent is spent. Many people worry about whether they have a market for their product or service, but do not put a lot of thought into how this new business will fit with their current lifestyle or with the goals they have for their future. This chapter helps you determine how a new aquaculture venture will fit with your personal and business goals.

### Example of aquaculture being a “Good Fit”

Robert loves to raise fish as a hobby and occasionally makes money on the side from it. Several of his friends and neighbors routinely ask him to sell them fish, so Robert is thinking about starting an aquaculture business. He is very busy with his job on the family’s hog farm and other activities and knows that if he starts a fish farm he might not be able to manage other responsibilities or be as active in the family farm. However, he feels that owning his own business while doing something he really loves will not only fulfill his dreams but also provide his family with some extra income.

### **Why Goals Are Important?**

Begin by determining the reasons you want to start an aquaculture business. Do you want to make a lot of money? Do you want to be your own boss? Do you simply want to provide a job for yourself or someone in your family? Think about your life as a business owner and manager, taking into account all aspects of your life. What benefits will you derive from the business? What are the impacts to your lifestyle? In other words, how will starting and managing a new aquaculture business affect your present job and personal life? Your reasons for starting a business will help guide your plan for starting and growing your business. You must think about how big you want the business to become. This is important because one of the reasons businesses fail is uncontrolled growth. Consider whether you want the business to remain small or grow enough to challenge a larger competitor. Is your goal to receive a profit commensurate with your effort and investment, or is it to earn as much profit as possible?

### **Setting Goals and Objectives**

While goals can be broad or general in nature, objectives should be clear and concise. Goals do not have to be specific enough for you to act on, but should give you a future target or list of things you want to work on. Objectives, however, need to be SMART—specific, measurable, action-oriented, realistic, and timely—to accomplish the goals you set for your business.

*Example of a Fish Farm Goal and Objectives*

Robert's goal is to start a fish farm specializing in yellow perch within the next 6 to 12 months. Robert's first objective is to write a business plan within the next 3 months. Robert's second objective is to contact an attorney, realtor, and his bankers for technical assistance as he starts his business in the next 6 to 12 months. His third objective is to have \$10,000 in sales his first year of business.

**Action Plans**

Once you have identified your objectives, the next step is to break each objective down into action plans, or all the steps necessary to achieve that objective. Think of action plans as small, manageable projects. Make sure your action plans are small enough that they can be accomplished in a few days or a month at most. Work on the most timely goals and objectives first, breaking them down into monthly action plans. Breaking down each objective into action plans will help you make the daunting task of starting a new aquaculture business manageable and less stressful.

*Example of a Fish Farm Action Plan*

Robert has decided to break down his first objective, the business plan, into manageable action plans. Some of his action plans for the first month are:

1. Assess his strengths and weaknesses.
2. Write a vision and mission statement.
3. Identify potential customer attributes.
4. Identify the target market.
5. Determine market potential.
6. Identify and assess fish farms in the area.
7. Research the industry.

Starting an aquaculture business takes thought and planning and understanding the reasons you want to start an aquaculture business and setting goals are essential to your success. Breaking this process into three steps (goals, objectives, action plans) will make it less daunting and more manageable.

**Suggested Readings**

Scarborough, N.M. and T.W. Zimmer. 2002. *Effective Small Business Management: An Entrepreneurial Approach*. Upper Saddle River, NJ: Prentice Hall.

Lesonsky, R. ed. 2004. *Start Your Own Business: The Only Start-up Book You'll Ever Need*, 3<sup>rd</sup> ed. Canada: Entrepreneur Media, Inc.

Turner, M.L. 1999. *The Unofficial Guide™ to Starting a Small Business*. New York, NY: Hungry Minds, Inc.



### III. Fundamentals of the Business Plan

One of the most important things you can do when starting a business is writing a business plan. A business plan is an evaluation of your business' chance of success. It is a game plan for managing a business successfully, a tool for comparing your actual and targeted results, and a written summary of your proposed aquaculture business. Last, it is a requirement for a small business loan. However, the real value of writing a business plan lies in the process of creating it. Research has shown that those who go through the process of writing a business plan are more likely to start their business than those who don't.

Use INventure to write your business plan. You can find it at [www.agecon.purdue.edu/planner](http://www.agecon.purdue.edu/planner). It is a web-based software program that assists you in evaluating your new business. It provides self-motivated feedback progressively over a series of stages. Each stage represents a section of the business plan that should be analyzed in order to accept or reject your proposed aquaculture business.

#### **Executive Summary**

The executive summary is the first section of the business plan you see but the last one you write. It is a summary of all the relevant parts of the business plan. You should write in lay language without industry jargon. In other words, anyone should be able to understand your entire business concept and your competitive advantage. You should consider it your "elevator pitch," and it should therefore be no longer than 2 pages.

#### **Mission Statement**

The mission statement is the second section of the business plan. Here you would write your vision of what the company is, what it is to become, and what it stands for. It is the broadest expression of a company's purpose and defines the direction in which it will move. A mission statement is generally a paragraph of approximately 3 to 5 sentences.

#### **Business and Industry Profile**

The business and industry profile is the third section of the business plan and can from 3 to 5 pages. Here you explicitly write out your goals and objectives. You also provide an industry analysis that demonstrates your knowledge of the industry and what trends make it possible for you to enter the market. You should also provide information on the existing and anticipated profitability of competing firms.

You may also want to provide a competitor analysis by doing the following.

- Provide information on competitors' market shares, products, and strategies.
- Demonstrate that your company has an advantage over its competitors.
- Provide a strengths, weaknesses, opportunities, and threats (SWOT) analysis.

Another part of this section is the business strategy, where you explain how you plan to gain a competitive advantage in the market and what sets your business apart from the competition. You should also demonstrate how you plan to meet goals and objectives in the face of competition and government regulations. This section should also include the image that your business will project and promote.

### **Marketing Strategy**

The fourth section of the business plan is the marketing strategy, which includes a description of your product and the services that you will provide. When you write the description of your product, you should focus on customer benefits and not just a detailed list of the product's features. This is a way to differentiate your business.

In this section you should provide proof that a profitable market exists. You should demonstrate customer interest prove that the target customers need or want the product and are willing and able to pay for it.

### **Plan of Operation**

The plan of operation is the fifth section of the business plan. Here you should construct an organizational chart with key personnel. This shows that you have the right people organized in the right way. Describe the firm's form of ownership and any leases, contracts, and other relevant agreements pertaining to the operation. You should also include resumes for anyone with at least a 20% ownership in the business.

### **Financial Plan**

The sixth section of the business plan is the financial plan. Your plan should include monthly pro forma financial statements for one year and by quarter for each of the next 2-3 years for the following three statements:

- Income statement
- Cash flow statement
- Balance sheet



You should include three sets of forecasts: optimistic, most likely, and pessimistic. You should also include a break-even analysis as part of your financial plan. Your financial plan ought to reflect your ability to repay loans to lenders and to produce adequate returns for investors.

### **Request for Funds**

If your business plan is being written for a bank loan or as an investment opportunity, the last section of the business plan is the request for funds. You should state the purpose of the loan or investment, the amount requested, and the plans for repayment or cash-out.

A business plan can seem overwhelming. However, remember that the process of thinking these things through is more important than the actual words you write. The key thing to remember about the process is that it is iterative. In other words, all the parts inform each other.

### Activity Worksheet: SWOT Analysis

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. A SWOT analysis provides you a great opportunity to assess your competitive advantage and survey the aquaculture industry to see how you fit in.

Strengths and weaknesses are things that are internal to your aquaculture business. For example, having several years experience of running a recreational fishing business would be a strength. However, having limited knowledge of marketing may be a weakness.

Strengths	Weaknesses
Example: several years of experience	Example: no marketing experience

Opportunities and threats are things that are external to your business. In other words, these are things that you cannot change yourself. For example, increasing ethnic populations could be an opportunity, and increasing federal or state environmental regulations could be a threat.

Opportunities	Threats
Example: increasing ethnic population	Example: increasing environmental regulations

## IV. Understanding Your Market

One crucial step in the start-up process and the business plan is understanding the specific product needs of the customers targeted by your business. By segmenting the market, you can find niches that give you a marketing edge over competitors.

### Undifferentiated versus Differentiated Marketing

There are essentially two basic approaches to marketing—undifferentiated and differentiated. Undifferentiated marketing treats the market as a whole, rather than as individual groups. It focuses on the common needs of the entire market, rather than the differences in groups within the market. This approach relies heavily on mass marketing and is implemented on the basis of cost savings to the business. It is generally more successful when the product has mass appeal or when there are virtually no competitors.

Differentiated marketing considers segments within the market, often working to build loyalty and encouraging repeat purchases through the consideration of specific customer needs and preferences. Differentiation through target marketing can create increased total sales because marketing efforts are concentrated in specific areas. It can also decrease the cost of production, distribution, and promotion. However, differentiated marketing is not without risk. There is always the chance that the segments will change in preferences or that a competitor will enter the same segment. If you have processed or value-added fish products, this approach to marketing may be appropriate.

### Market Segments

Market segmentation occurs when a business identifies the potential buyers within a market who have similar needs, show similar buyer behavior, and are expected to be the most receptive to the product. In order to determine the process a respective customer goes through to purchase and use the product, you must understand how the target market will use the product. It is very important to determine whether potential customers come from the consumer or business market. For example, most fish farmers in Indiana sell their fish to live ethnic markets. Asians, some Hispanics, and Africans prefer to purchase live fish, so these types of customers can be your target market. Consumer and business markets have very distinct needs. The following categories are some of the most common means by which consumer markets can be segmented.

*Geography* – Are your customers local, regional, national, or international?

*Psychographics* – Are there behavioral characteristics that differentiate the customers?

*Socio-Cultural Factors* – Are there cultural considerations, social connections, or other personal factors which might shape the customer's needs, wants, and behavioral patterns?

*Demography* – Are the customers old, young, male, female, low income, or high income?

Suppose you want to segment the live market within the fish retail business, the following questions would help you to serve the customers in that market.

- *Industry* – Do the customers' needs differ across the fish retail business?
- *Geography* – Do the customers in different regions (Asia, Africa, Latin America) have different needs?
- *Purchasing* – Who in the business is involved in purchasing live fish? Which factors influence their decisions? What is their background and knowledge with respect to live fish?
- *Company* – What are company buying policies and procedures, financial constraints, and timing of purchases?

You should answer the following questions for each market segment, regardless of whether the business is in the consumer or supply market:

- Is the segment viable? Can we profit from it? Who are the other suppliers of fish?
- Is the segment accessible? How easy is it to get into this segment of the fish market?
- Is the segment measurable? Can I obtain realistic data to consider its potential, e.g., how much live fish is purchased per week or month?

After identifying the potential segments within the market, you should look at a number of them before making a final decision on which to target. Chicago and many of the major towns within Indiana have fish retail markets and ethnic stores that sell live fish. It is important to pinpoint the benefits that the targeted customers are seeking, such as quality, low price, convenience, availability, status, etc. You must ask questions such as the following.

- What are the features that are considered basic that all customers expect of the product and/or service?
- What are features of products and/or services in the industry that help customers differentiate between similar products and/or services?
- What are features of the products and/or services in the industry that energize customers to make immediate judgments about purchasing the product and/or service?

- What frustrates customers about the existing product and/or service choices?
- What key feature is missing from the existing product and/or service choices?

After determining the benefits your targeted customers would seek from your product, it is essential to design your product to meet those specific needs and preferences. You should develop a separate marketing plan for each targeted group to meet their needs and expectations of your product.

It is important to understand how your product can create value for your customer. The following four questions will help you determine if your product and/or service will indeed, create value.

- Will my product and/or service provide an economic gain for the customer?
- Will my product and /or service provide a better price-performance balance than current products and/or services?
- Will customers perceive a benefit from my product and/or service that current products and/or services don't have?
- Will customers obtain emotional benefits from my product and/or service that other products don't provide?

In addition to understanding the segmentation categories listed above, you can do the following to assist in segmenting your market.

- Visit fish retail stores in some Indiana cities and Chicago, if possible.
- Contact other aquaculture farmers serving a similar market or key trade-end users.
- Watch what works for key competitors, borrowing the successful elements of their marketing strategy while adding other unique marketing techniques to ensure product differentiation.
- Read aquaculture trade and association publications, basic research publications, and government publications.

### **Aquaculture Marketing Scenarios**

Marketing strategies differ depending on the species of fish. Largemouth bass, yellow perch, and hybrid striped bass have different customer markets, distribution systems, and processing methods. Effective marketing methods for these species are listed below.

### Largemouth Bass

- Live for pond stocking (recreational sport fishing)
- Live for the live fish retail markets, especially Asian stores

### Yellow Perch

- Processed or value-added and sold to grocery wholesalers, food service distributors, or directly to the public
- Processed into whole-dressed fresh-on-ice, or filleted, fresh on ice, frozen, breaded

### Hybrid Striped Bass

- Live for pond stocking (recreational sport fishing)
- Live for the live fish retail markets, especially Asian stores
- Processed or value-added and sold to grocery wholesalers, food service distributors, or directly to the public
- Processed into whole-dressed fresh-on-ice, or filleted, fresh on ice, frozen, breaded

## **Assessing Your Sales Potential**

The first step in assessing sales potential is determining your potential market. Your potential market is all the consumers who may be interested in your product. For example, for a largemouth bass business, the potential market would include all the recreational sport fisheries in Indiana.

The second step in assessing sales potential is determining the available market. Your available market includes all the consumers who are interested in your product, are willing and able to pay for your product, and have access to your product. This step requires you to break down your potential market by beginning to define your customer segments. You can further break down your market to those customers that you intend to target for a particular offer. This subset is called the “target market.” This requires you to further segment the market to understand the needs and preferences of your customers.

Once you have identified your target market, you can begin to calculate the estimated sales potential for your product. The next step is to determine your selling price or the revenue you expect per customer. Finally, you should try to determine the share of the market you can obtain.

Example: Determining Sales Potential for a Startup Aquaculture Business

Robert wants to start a food fish farm in Indiana. He has decided to concentrate on yellow perch in the Lake County because he knows that populations of the species are on the decline in the Great Lakes. From the 2000 census, Robert also knows that there are 126,961 families living in Lake County. Statistics published in several trade magazines indicate that on average households spent \$750 on fish consumption. He has decided to concentrate on selling to various societal groups, religious groups, associations, caterers, restaurants, and grocery stores in neighborhoods of Lake County where household incomes are over \$100,000, because these households would have an interest in and income to afford high quality fish. From industry research, Robert has learned that there are no food fish farms in Lake County, but the area has a tradition of Friday night fish fries with yellow perch, which leads him to believe that he might be able to sell his fish in the future.

Potential Market (number of households)	\$126,961
Available market (households with income over \$100,000)	18,848
Qualified available market (families with income over \$100,000)	16,590
Average spent on fish consumption (per household)	\$750

**Sales potential = (qualified available market) \* (household expenditure on fish consumption)**

Sales potential = 16,590 \* \$750 = 12,442,500

Estimated market share = 4.5%

Estimated sales potential (per year) = \$559,913



### Activity Worksheet: Marketing Your Food Fish

1. What customers will you target?
  - a. Wholesalers (e.g., fish brokers, grocery wholesalers)?
  - b. Retailers (e.g., chain and independent grocers)?
  - c. Food service (e.g., hospitality services, restaurants)?
  - d. Retail customers?
  - e. Sport fisheries?

2. What food fish will you offer?
  - a. Largemouth bass?
  - b. Yellow perch?
  - c. Hybrid striped bass?
  - d. Other?

3. What price range will you charge for your product?

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4. How will your product be distributed?
  - a. Live?
  - b. On ice?
  - c. Frozen?
  - d. Processed (i.e. filleted, breaded, seasoned)?
  - e. Transportation?

5. How will you promote your product?

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## V. A Case Study Using Indiana MarketMaker

Indiana MarketMaker is an interactive mapping system that locates businesses and markets of agricultural products in Indiana, providing an important link between producers and consumers. MarketMaker is rich with demographic and business data that the user can query. Details can be summarized on a map to show concentrations of consumer markets and strategic business partners. Census data is included in Indiana MarketMaker, which allows a producer wanting to sell fish to Asian consumers, for example, can request a map showing the greatest concentration of different income groups of Asian households, then request a complete demographic profile of those locations.

### Finding a New Market for Yellow Perch

Robert Anderson is a fish farmer who would like to sell yellow perch to high-income Hispanic consumers. Robert thinks potential customers would be Hispanic households where income is in excess of \$100,000. Robert wants to use Indiana MarketMaker at [www.inmarketmaker.com](http://www.inmarketmaker.com) to learn three things.

- 1.) Where are the highest concentrations of high-income Hispanic households?
- 2.) What are the names of the grocery stores that serve those high-income Hispanic neighborhoods, and where are they located?
- 3.) What are the names of the restaurants that serve those high-income Hispanic neighborhoods, and where are they located?

Here is how Robert would use Indiana MarketMaker to find answers to his marketing questions.

- 1) Where are the high concentrations of Asian households?
  - From the **Begin Your Search** page, Robert selects **Find a Market**.
  - In drop box, Robert chooses **Income by Race**.
  - In drop box **Race**, Robert chooses **Asian**. In **Search By**, Robert chooses whether he wants to search in the **State/County** or **Multistate**. In **Search Location**, Robert can choose to search statewide or by each county.
  - A map of the county area shows the census data requested. The legend indicates the number of households in each census tract. The dark red color has the largest number

of households for the selected census category.

- Robert wants to focus on the census tracts with the highest concentration of Asian households. The menu to the left of the map includes **Zoom In, Zoom out, Pan, Census Report, Census Info, and Full Extent**. Using the buttons to the left of the map, Robert can click on **Census Info**, then on a location within the map to obtain the data. A pop-up screen containing the census data shows up. If Robert clicks **Census Report**, a summary table appears below the map containing the data.

2) What are the names of grocery stores that serve those Asian neighborhoods, and where are they located?

- To search for grocers, Robert clicks on the **Find Business** tab located at the top of the map beside the **Find a Market** tab. In the **Business Type** drop down box, he selects **Food Retailer**. In the **Line of Business** drop down box, he selects **Grocer Store**. He can then search within the **current map, city, county, statewide** or **multi-state**. Robert then clicks on the **Refresh Data** tab. The speed of the grocery store mapping will depend on the number of grocery stores in the chosen area.
- Once the grocery stores appear on the map, Robert has two options. He can identify individual grocery stores by using the **Full Extent** tool to the left of the map. The **Full Extent** provides a table of information on all stores located in the map. Below the map, the name, address, city, state, and details appear. Robert can find out more about a specific store by clicking on **View Details** which provides information about a business that includes the name, address, telephone numbers, website address, sales volume, number of employees, and map of the location.
- The results of the search should appear in a table below the map. If doesn't, Robert clicks on **Refresh Data** tab to the top right of the map. A results page will appear below the map listing all of the grocery stores in the area of the map.
- Robert has decided to contact a small grocer to market his fish. Even though there are larger ones in the same area, Robert realizes that he cannot supply them with the amount of product they need and that he will not have as much control on the price of his product.

- 3) What are the names of the fish markets that serve those high-end Asian neighborhoods and where are they located?
- To search for fish markets, again Robert clicks on the **Find Business** tab. In the **Business Type** drop down box, he selects **Food Retailer**. In the **Line of Business** drop down box, he selects **Meat and Fish Market**. He then can search by city, county, statewide, or multistate. The speed of the meat and fish market mapping will depend on the number of markets in the chosen area.
  - Once the meat and fish markets appear on the map, Robert has two options. He can identify individual market by using the **Full Extent** tool. He can click on any market marker to receive information on that location. Below the map, the name, address, city, state, and details appear. Robert can find out more about a specific store by clicking on **View Details** which provides information about a business that includes the name, address, telephone numbers, website address, sales volume, number of employees, and map of the location.
  - Robert has also decided to contact a small meat and fish market to sell his fish. Robert realizes that he can supply them with the amount of product they need and that he will have as much control on the price of his product.

## VI. Aquaculture Production Methods

The production method used in aquaculture depends on the type of the water-holding facility in which the fish are grown. Water-holding facilities are classified into pond culture, cage culture, raceway culture, and water recirculating systems. Not all fish grow well in all of these facilities; some do better than others in particular facilities. The table below provides a list of species suitable for commercial culture in Indiana and the common production system used.

<b>Species</b>	<b>Market Product</b>	<b>Common Production System</b>
Bluegill ( <i>Lepomis spp</i> )	Sport Fish, Foodfish	Ponds, Recirculating system
Channel Catfish ( <i>Ictalurus punctatus</i> )	Sport Fish, Foodfish	Ponds, Cages
Fathead minnows ( <i>Pimephales promelas</i> )	Bait fish	Ponds, Recirculating system
Freshwater Prawn ( <i>Macrobrachium rosenbergii</i> )	Foodfish	Ponds
Goldfish ( <i>Carassius auratus</i> )	Ornamental fish, Bait fish	Ponds, Recirculating system
Golden Shiner ( <i>Notemignus crysoleucas</i> )	Bait fish	Ponds, Recirculating system
Hybrid Striped Bass ( <i>Morone saxatilis x Morone chrysops</i> )	Sport Fish, Foodfish	Ponds, Cages, Recirculating system
Largemouth Bass ( <i>Micropterus salmoides</i> )	Sport Fish, Foodfish	Ponds
Rainbow Trout ( <i>Oncorhynchus mykiss</i> )	Sport Fish, Foodfish	Raceways/Flow-through system, Ponds, Cages
Smallmouth Bass ( <i>Micropterus dolomieu</i> )	Sport Fish, Foodfish	Ponds
Tilapia ( <i>Oreochromis spp</i> )	Foodfish	Ponds, Cages, Recirculating system
Walleye ( <i>Stizostedium vitreum</i> )	Sport Fish, Foodfish	Ponds
Yellow Perch ( <i>Perca flavescens</i> )	Sport Fish, Foodfish	Ponds, Recirculating system

## Pond Culture

Ponds can be earthen ponds or concrete ponds, but most production in the US takes place in earthen ponds. Ponds vary in sizes and range from about a quarter acre to several acres. Fish production may take place in a farm pond or in ponds specifically designed and constructed for aquaculture. Though most farm ponds have fish growing in them, they may not be suitable for commercial aquaculture because, quite often, they have uncertain water quality and uneven water depths and do not have a drainage system. However, many farm ponds have been used to produce fish in cages and in recreational or fee-fishing operations.

Ponds specifically designed and constructed for fish culture require some amount of clay soils to retain water. Ponds that are less than 2 acres are recommended because they are less difficult to manage than larger ones. For detailed information on pond construction, see:

1. USDA- NRCS - Natural Resources Conservation Service publication “Ponds - Planning, Design, Construction” (<http://www.in.nrcs.usda.gov/pdf%20files/PONDS.PDF>).
2. Southern Regional Aquaculture Center (SRAC) Publication SRAC 101, “Construction of Levee-Type Ponds for Fish Production” (<http://srac.tamu.edu/>).

## Caged Culture

Cage culture involves producing fish in floating cages in lakes or ponds, allowing water to flow freely between the fish and the pond or lake. Cage culture is similar to pond culture, except that fish are enclosed in cages and not swimming freely in the pond. One major advantage is the convenience of harvesting fish, especially where the pond or lake is too deep for seining. Cages vary in shape and size, and can be rectangular, square, or round.

The cage size depends on the size of the pond or lake, availability of aeration, and the method of harvest. Larger cages are difficult to handle during harvesting. Manufactured cages are commonly sold as 4x4 feet (diameter x depth) cylindrical cages, 4x4x4 feet and 8x8x4 feet (length x width x depth) square cages, and 8x4x4 feet and 12x6x4 feet rectangular cages. The cages must be placed in open areas of the pond or lake with at least 2 feet of water between the bottom of the cage and the pond bottom, allowing adequate water circulation to supply needed oxygen in and around the cages. For detailed information on cage construction and culture, see:

1. North Central Regional Aquaculture (NCRAC) Publication Technical Bulletin #110 “Cage Culture of Fish in the North Central Region” (<http://www.ncrac.org/Topics/tb110.htm>).
2. Southern Regional Aquaculture Center (SRAC) publication SRAC 162, “Cage Culture: Cage Construction and Placement” (<http://srac.tamu.edu/>).

3. Southern Regional Aquaculture Center (SRAC) publication SRAC 163 “Cage Culture: Species Suitable for Cage Culture” (<http://srac.tamu.edu/>).

### **Raceways/Flow-Through System**

Culture systems where water moves or flows through channels at relatively high rates are commonly called “raceways” or “flow-through” systems. The channels can be ponds or in-ground or above ground tanks constructed with concrete, tile, brick, wood, etc. They are arranged in a series of terraced raceways to allow water to flow by gravity through each unit. The feature that distinguishes raceways from ponds is the flow through, so raceways generally require large volumes of good quality water to flow through the units.

Water sources for raceways are normally obtained from a spring, creek, or stream and channeled through the raceways by gravity. Water can be pumped back (recirculated) to flow through the units, but this can result in a very expensive operation. The water flow through the raceways removes fish wastes from the units, and at the same time the water is replenished with oxygen as it spills into the next raceway along the terrace. Most raceway culture in the US occurs where there are high volumes of spring water for the production of coldwater species such as trout. For detailed information on raceways and flow-through systems, see:

1. Aquanic – Raceways (<http://aquanic.org/beginner/systems/raceway.htm>).
2. University of Florida – IFAS Extension publication FA020 “Raceway Production of Warm-Water Fish” (<http://edis.ifas.ufl.edu/FA020>).

### **Water Recirculating Systems**

Simple recirculating systems for aquaculture production consist of (a) a tank for holding the fish, (b) a solid waste removal system for removing solid fish waste and uneaten feed, (c) a biofilter for removing dissolved toxic wastes, (d) an aerator to supply oxygen, and (e) a pump to recirculate the water. Other components can be added to recirculating systems to make them more efficient, but they also add additional complexity. Because the systems involve recirculating the water used, relatively less water is needed for this type of culture system compared to pond culture or raceway/flow-through systems.

Fish production requires attention to critical factors such as water temperature, concentrations of dissolved oxygen, un-ionized ammonia-nitrogen, nitrite concentration, pH, and alkalinity levels. Most recirculating systems are placed indoors to allow the producer to maintain control over these critical factors to ensure good water quality during the growing period. Recirculating aquaculture systems are capital intensive and require close monitoring of the growing



conditions of the fish, but they also allow for year-round control of growing conditions. Therefore, producers interested in this type of production system should begin on a small scale before expanding into a large-scale production system. For detailed information on recirculating aquaculture systems (RAS), see:

1. Southern Regional Aquaculture Center (SRAC) Publication SRAC 451 “Recirculating Aquaculture Tank Production Systems: An Overview of Critical Considerations” (<http://srac.tamu.edu/>).
2. Southern Regional Aquaculture Center (SRAC) Publication SRAC 452 “Recirculating Aquaculture Tank Production Systems: Management of Recirculating Systems” (<http://srac.tamu.edu/>).
3. Southern Regional Aquaculture Center (SRAC) Publication SRAC 453 “Recirculating Aquaculture Tank Production Systems: A Review of Component Options” (<http://srac.tamu.edu/>).
4. Southern Regional Aquaculture Center (SRAC) Publication SRAC 454 “Recirculating Aquaculture Tank Production Systems: Integrating Fish and Plant Culture” (<http://srac.tamu.edu/>).

## VII. Income Statement

Part of an integrated system of financial statements, the income statement is valuable as both a planning and a management tool to help control business operations during an accounting period that can be anything from a month to a year. The income statement indicates a firm's profitability. Monthly income projections can be calculated and then compared to the firm's actual income so that the manager can correct any problems. An example of an income statement is shown on the next page.

The first item on the income statement is net sales (gross sales minus returns). Net sales is followed by cost of goods sold. Cost of goods sold is only required if the firm is an intermediary such as a retail store or wholesaler. Cost of goods sold is equal to beginning inventory plus goods purchased minus ending inventory. Gross profit is the net sales minus the cost of goods sold. If the firm manufactures a product, then the cost of goods sold would be equal to the beginning inventory plus goods manufactured minus ending inventory. However, most farming companies do not have a cost of goods sold section.

The next category on the income statement is the variable expenses. These are expenses directly related to the operation of the business that change from one accounting period to the next. The following items can be part of the variable expense category: wages, uncollectible accounts, and office supplies. The last category on the income statement is the fixed expenses, such as rent, depreciation, loan payments, and utilities.

Total expenses (variable plus fixed) are then subtracted from gross profit to calculate net profit (loss) before taxes. The next step is to calculate the taxes that must be paid for the accounting period. Net profit (loss) is then calculated by subtracting taxes from net profit before taxes. If any part of the firm's profit is paid to investors, then those are written in the dividends paid line. The remainder is then the undistributed earnings of the firm.

## Sample Income Statement

Company Name \_\_\_\_\_

For year ending \_\_\_\_\_, 20\_\_\_\_\_

Net Sales		_____
Cost of Goods Sold		
	Beginning Inventory	_____
+	Goods Purchased	_____
-	Ending Inventory	_____
Cost of Goods Sold		_____
Gross Profit (Net Sales - Cost of Goods Sold)		_____
Variable Expenses		
	Salary/Wages	_____
	Uncollectable Accounts	_____
	Legal/Accounting	_____
	Advertising	_____
	Automobile	_____
	Office supplies	_____
	Interest	_____
	Miscellaneous Expenses	_____
	Total Variable Expenses	_____
Fixed Expenses		
	Rent	_____
	Depreciation	_____
	Utilities	_____
	Insurance	_____
	License/Permits	_____
	Loan Payments	_____
	Total Fixed Expenses	_____
Total Expenses		_____
Net Profit (Loss) before Taxes		_____
Taxes		_____
Net Profit (Loss) after Taxes		_____
Dividends Paid		_____
Undistributed Earnings		_____

## VIII. Balance Sheet

Part of an integrated system of financial statements, the balance sheet is the financial statement that brings things into perspective. The statement of cash flows and the income statement are used to record the events between balance sheets. An is shown on the page 29.

The balance sheet is grouped into three major categories. The assets of the firm, or what the firm owns, are listed first. The second category is the liabilities of the firm, or what the firm owes. The final category listed on the balance sheet is the owner's equity, or the owner's claim on the assets of the firm.

The assets category is divided into various subcategories listed in order of liquidity or how fast the asset can be converted into cash. It is the standard to have at least these three categories in the following order: (1) current assets; (2) fixed assets; and (3) intangible assets. Current assets are those assets that will be used within the current operating period, such as cash, accounts receivable, inventory, and prepaid expenses. Fixed assets are assets that will not be used within the current operating period, such as land, buildings, and equipment. Accumulated depreciation is listed under the fixed asset category as a negative (hence the parentheses). Intangible assets are assets are non-physical assets or things of value such as patents, trademarks, and copyrights. Total assets are the sum of the current, fixed, and intangible assets.

Although there are many methods of calculating depreciation, the simplest method is straight-line depreciation. The Internal Revenue Service specifies the useful life of an asset. In other words, the IRS specifies for how long an asset can be depreciated. In general, office equipment and automobiles have a useful life of five years, and machinery has a useful life of seven years. The salvage value of an asset is the expected value of that asset at the end of its useful life. Hence, the annual depreciation of an asset is calculated as follows:

$$\text{Depreciation} = \frac{\text{Initial cost of the asset} - \text{Salvage value of the asset}}{\text{Useful life of the asset}}$$

Liabilities are what the firm owes. Current liabilities are items that the firm must pay in the short term or current operating period, such as accounts payable, interest payable, and wages. Taxes payable are what the firm must pay to the state and federal government and can include

items such as state tax, self-employment tax, and sales tax. Long-term liabilities are liabilities that will not be due until after the current operating period, such as mortgages or bonds. Notes payable are listed under the current and long-term liability categories. Notes payable under the current liability category are items such as short-term loans that are due in the current operating period. Notes payable under the long-term liability category are loans that will not be due in the current operating period, such as equipment purchased and financed through a manufacturer.

Owner equity denotes the owner's claim on the firm's assets. In other words, owner equity is an investor's initial investment in the firm. Undistributed earnings are also a part of the owner equity category and are the profits retained by the firm. The last line on the balance sheet is the sum of total liabilities and total owner equity. In order for the financial statement to balance, the firm's assets must equal the firm's liabilities plus the owner equity.

### **Suggested Readings**

You can download the following publications at [www.ces.purdue.edu/extmedia/agecon.htm#1](http://www.ces.purdue.edu/extmedia/agecon.htm#1).

- Capital Investment Analysis and Projection Assessment, EC-731
- Estimating Breakeven Sales for Your Small Business, EC-725

## Example of a Balance Sheet

Company Name \_\_\_\_\_

As of \_\_\_\_\_, 20\_\_

### Assets

#### Current Assets

Cash (all) \_\_\_\_\_

Accounts Receivable \_\_\_\_\_

Inventory \_\_\_\_\_

Short-term Investments \_\_\_\_\_

Prepaid Expenses \_\_\_\_\_

#### Fixed Assets

Land \_\_\_\_\_

Building(s) \_\_\_\_\_

Equipment \_\_\_\_\_

Accumulated Depreciation (building & equipment) \_\_\_\_\_ ( )

#### Intangible Assets

Patents \_\_\_\_\_

Trademarks \_\_\_\_\_

Copyrights \_\_\_\_\_

#### **Total Assets**

### Liabilities

#### Current Liabilities

Accounts Payable \_\_\_\_\_

Notes Payables \_\_\_\_\_

Interest Payable \_\_\_\_\_

Payroll \_\_\_\_\_

Dividend \_\_\_\_\_

#### Taxes Payable

Federal \_\_\_\_\_

State \_\_\_\_\_

Self-employment \_\_\_\_\_

Sales \_\_\_\_\_

Property \_\_\_\_\_

#### Long Term Liabilities

Mortgage \_\_\_\_\_

Notes Payable \_\_\_\_\_

Bonds Payable \_\_\_\_\_

#### **Total Liabilities**

### Owner Equity

Partner #1 \_\_\_\_\_

Partner #2 \_\_\_\_\_

Undistributed Earnings \_\_\_\_\_

#### **Total Owner Equity**

#### **Total Liabilities + Total Owner Equity**

## **IX. Startup Kit Budget Worksheets**

- I. Cage Culture
- II. Pond Culture
- III. Recirculating System

These Worksheets are also available in the accompanying CD.



**CAGE CULTURE**

The budget presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

**You should change the cells in yellow with blue font to reflect your situation.**

Choose the fish species from the drop down menu:

**Hybrid Striped Bass**

Variables	Unit	Value	
Length of production	month	18	<i>time from fingerling to harvest</i>
Number of cycles/fish stockings in a year	#/yr	2	<i>no. of times you wish to harvest(stock)/year for continuous production</i>
Number of cages harvested per cycle	cages/cycle	10	<i>no. of cages you wish to harvest/stock at one time</i>
Total number of cages needed	cages	30	
Minimum water surface acreage needed	acres	7.2	<i>Based on max fish production of 5K lb/ac/year</i>
Cage Shape		Rectangular	<i>choose the cage size from the drop down menu</i>
Cage Dimensions			
	Diameter	5	
	Length	10	
	Width	6	
	Height	6	
Individual Cage Volume	gals	2,244	<i>volume is calculated allowing a foot above water surface</i>
Stocking density/cage	/cage	1,496	<i>stocking rate is calculated as a lb fish at market per gallon of water</i>
Fingerling size (5")	lb	0.03	<i>assumes 1,000 5"-fingerlings weigh 30lb</i>
Harvest size	lb	1.5	
Feed Conversion Ratio (FCR)		1.5	
Survival	%	80%	<i>% of fish that survives until harvest</i>

Gross Receipts:		\$/unit	quantity / cycle	\$/cycle	\$/year
Fish sale	\$/lb	\$ 2.75	17,952	\$ 49,368.00	\$ 98,736.00
Miscellaneous Receipts	\$/lb	\$ -		\$ -	
<b>Total Receipts</b>				<b>\$ 49,368.00</b>	<b>\$ 98,736.00</b>

<b>Write down stocking months</b>	<b>April</b>	<b>May</b>				
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Variable Inputs:		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost
Fingerlings	\$	\$ 0.45	14,960	\$ 6,732.00	\$ 13,464.00	\$ 0.38	17%
Feed	\$/lb	\$ 0.45	26,255	\$ 11,814.66	\$ 23,629.32	\$ 0.66	30%
Chemicals	\$/cage	\$ 5.00	50	\$ 250.00	\$ 500.00	\$ 0.01	1%
Electricity cost for aeration	\$/kwh	\$ 0.10	3,600	\$ 360.00	\$ 720.00	\$ 0.02	1%
Hired Labor - Hours	\$/hr	\$ 10.00	1,460	NA	\$ 14,600.00	\$ 0.41	19%
Harvesting	\$/lb	\$ 0.04	17,952	\$ 718.08	\$ 1,436.16	\$ 0.04	2%
Transportation Costs of Fingerlings	\$/fish	\$ 0.02	14,960	\$ 299.20	\$ 598.40	\$ 0.02	1%
Transportation Costs to Market	\$/lb	\$ -	17,952	\$ -	\$ -	\$ -	0%
Miscellaneous	\$/cage	\$ 10.00	100	\$ 1,000.00	\$ 2,000.00	\$ 0.06	3%
Other	\$	\$ -		\$ -	\$ -	\$ -	0%
<b>Total Variable Cost</b>				<b>\$ 21,173.94</b>	<b>\$ 56,947.88</b>	<b>\$ 1.59</b>	<b>73%</b>

*assumes 24 hr continuous aeration from May-Sep  
assumes unpaid owner labor throughout production*

Overhead Costs		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost
Repair and Maintenance	\$/lb	\$ 0.01	17,952	\$ 179.52	\$ 359.04	\$ 0.01	0%
Water acres rental	\$/acre	\$ 250.00	7	NA	\$ 1,795.20	\$ 0.05	2%
Insurance	\$/yr	\$ 1,000.00			\$ 1,000.00	NA	1%
Adminstration/Management - legal fees, professional services, etc.	% of TVC	5%	NA	\$ 1,058.70	\$ 2,847.39	\$ 0.08	4%
Other 1	\$	\$ -				NA	0%
Other 2	\$	\$ -				NA	0%
<b>Total Overhead Costs</b>				<b>\$ 1,238.22</b>	<b>\$ 6,001.63</b>	<b>\$ 0.17</b>	<b>8%</b>

*assumes a rental or opportunity cost for use of lake/large pond  
assumes a % of Total Variable Cost (TVC)*

**Annual capital costs calculation assumes a straight line depreciation**  
**All capital costs are incurred beginning of year 1**

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost / cycle	% of total cost
Feeders	unit	\$ 60.00	30	\$ 1,800.00	5	\$ -	\$ 360.00	\$ 180.00	0%
Storage Shed	unit	\$ 4,000.00	1	\$ 4,000.00	10	\$ 400.00	\$ 360.00	\$ 180.00	0%
Electrical aerator (or air lifts)	unit	\$ 1,250.00	7	\$ 8,976.00	5	\$ 897.60	\$ 1,615.68	\$ 807.84	2%
Emergency Generator	unit	\$ 1,000.00	1	\$ 1,000.00	10	\$ 100.00	\$ 90.00	\$ 45.00	0%
Transport tank	unit	\$ -	1	\$ -	10	\$ -	\$ -	\$ -	0%
Mower	unit	\$ 500.00	1	\$ 500.00	7	\$ 50.00	\$ 64.29	\$ 32.14	0%
Misc (waders, scale, test equip)	unit	\$ 2,000.00	1	\$ 2,000.00	5	\$ 200.00	\$ 360.00	\$ 180.00	0%
Cages	unit	\$ 500.00	30	\$ 15,000.00	5	\$ 1,500.00	\$ 2,700.00	\$ 1,350.00	3%
Dock/Boat	unit	\$ 3,500.00	1	\$ 3,500.00	20	\$ 350.00	\$ 157.50	\$ 78.75	0%
Other 1	\$	\$ -		\$ -	1	\$ -	\$ -	\$ -	0%
Other 2	\$	\$ -		\$ -	1	\$ -	\$ -	\$ -	0%
<b>Total Capital Costs</b>				<b>\$ 36,776.00</b>			<b>\$ 5,707.47</b>	<b>\$ 2,853.73</b>	<b>7%</b>

Loan Information	Years	Interest Rate	Loan Balance	Cost / year	Cost / cycle	cost
Capital	7	7.00%	\$ 36,776.00	\$ 6,823.91	\$ 3,411.95	9%
Truck	5	7.00%	\$ 12,000.00	\$ 2,926.69	\$ 97.56	4%
Loan 3	0	0.00%	\$ -	\$ -	\$ -	0%
Loan 4	0	0.00%	\$ -	\$ -	\$ -	0%
<b>Total Loan Costs</b>			<b>\$ 48,776.00</b>	<b>\$ 9,750.59</b>	<b>\$ 3,509.51</b>	<b>12%</b>

Summary	Value/cycle	Value/year	Value/cage	% of total cost
Total Receipts	\$ 49,368.00	\$ 98,736.00	\$ 4,936.80	
Total Variable Costs	\$ 21,173.94	\$ 56,947.88	\$ 2,117.39	81%
Total Overhead Costs	\$ 1,238.22	\$ 6,001.63	\$ 123.82	9%
Average Interest Paid	\$ 973.20	\$ 1,946.40	\$ 350.95	3%
Depreciation	\$ 2,853.73	\$ 5,707.47	\$ 285.37	8%
<b>Total Cost</b>	<b>\$ 26,239.09</b>	<b>\$ 70,603.38</b>	<b>\$ 2,877.54</b>	<b>100%</b>
Net Revenue above Variable/Overhead Costs	\$ 26,955.84	\$ 35,786.49	\$ 2,695.58	
Net Revenue above Total Costs	\$ 23,128.91	\$ 28,132.62	\$ 2,059.26	
Breakeven Price with variable/overhead cost	/lb	\$ 1.75		
Breakeven Price with total cost	/lb	\$ 1.97		

**INCOME STATEMENT**  
**Year Ending**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>REVENUE</b>						
Fish Sales	\$ -	\$ 98,736.00	\$ 98,736.00	\$ 98,736.00	\$ 98,736.00	\$ 98,736.00
Other Income	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Gross Revenue</b>	<b>\$ -</b>	<b>\$ 98,736.00</b>	<b>\$ 98,736.00</b>	<b>\$ 98,736.00</b>	<b>\$ 98,736.00</b>	<b>\$ 98,736.00</b>
<b>EXPENSES</b>						
Operating Expenses	\$ 47,722.88	\$ 62,949.51	\$ 62,949.51	\$ 62,949.51	\$ 62,949.51	\$ 62,949.51
Depreciation	\$ 5,707.47	\$ 5,707.47	\$ 5,707.47	\$ 5,707.47	\$ 5,707.47	\$ 5,707.47
Interest	\$ 3,414.32	\$ 2,970.78	\$ 2,496.19	\$ 1,988.39	\$ 1,445.03	\$ 863.64
<b>Total Expenses</b>	<b>\$ 56,844.67</b>	<b>\$ 71,627.76</b>	<b>\$ 71,153.17</b>	<b>\$ 70,645.37</b>	<b>\$ 70,102.01</b>	<b>\$ 69,520.62</b>
<b>Net Farm Income from Operations</b>	<b>\$ (56,844.67)</b>	<b>\$ 27,108.24</b>	<b>\$ 27,582.83</b>	<b>\$ 28,090.63</b>	<b>\$ 28,633.99</b>	<b>\$ 29,215.38</b>
<b>Gain/Loss on Sale of Capital Assets</b>						

**POND CULTURE**

The budget presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

**You should change the cells in yellow with blue font to reflect your situation.**

Choose the fish species from the drop down menu:

**Large Mouth Bass**

Variables	Unit	Value	
Length of production	month	18	<i>time from fingerling to harvest</i>
Number of cycles/fish stockings in a year	#/yr	2	<i>number of times you wish to harvest/stock in a year for continuous production</i>
Number of ponds harvested per cycle	ponds/cycle	2	<i>number of ponds you wish to harvest/stock at one time</i>
Total number of ponds needed	ponds	6	
Pond size	acre	1	<i>pond size of 0.5 to 5 acres recommended</i>
Stocking density	/acre	5,000	<i>stocking rate depends on the species</i>
Fingerling size (6")	lb	0.04	<i>assumes 1,000 6"-fingerlings weigh 35lb</i>
Harvest size	lb	1.5	
Feed Conversion Ratio (FCR)		2.0	
Survival	%	85%	<i>% of fish that survives until harvest</i>

Gross Receipts:		\$/unit	quantity / cycle	\$/cycle	\$/year
Fish sale	\$/lb	\$ 4.70	12,750	\$ 59,925.00	\$ 119,850.00
Miscellaneous Receipts	\$/lb	\$ -		\$ -	
<b>Total Receipts</b>				<b>\$ 59,925.00</b>	<b>\$ 119,850.00</b>

Variable Inputs:		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost	
Fingerlings	\$	\$ 1.00	10,000	\$ 10,000.00	\$ 20,000.00	\$ 0.78	21%	
Feed	\$/lb	\$ 0.45	24,700	\$ 11,115.00	\$ 22,230.00	\$ 0.87	23%	
Chemicals	\$/acre	\$ 300.00	2	\$ 600.00	\$ 1,200.00	\$ 0.05	1%	
Electricity cost for aeration	\$/kwh	\$ 0.15	3,672	\$ 550.80	\$ 1,101.60	\$ 0.04	1%	<i>24 hr aerat'n from May-Sep</i>
Hired Labor - Hours	\$/hr	\$ 10.00	1,825	NA	\$ 18,250.00	\$ 0.72	19%	<i>20 hrs / wk / person</i>
Harvesting	\$/lb	\$ 0.05	12,750	\$ 637.50	\$ 1,275.00	\$ 0.05	1%	
Transportation Cost of Fingerlings	\$/fish	\$ 0.05	10,000	\$ 500.00	\$ 1,000.00	\$ 0.04	1%	
Transportation Cost to Market	\$/lb	\$ 0.05	12,750	\$ 637.50	\$ 1,275.00	\$ 0.05	1%	
Miscellaneous	\$/acre	\$ 0.05	12,750	\$ 637.50	\$ 1,275.00	\$ 0.05	1%	
<b>Other</b>	\$	\$ -		\$ -	\$ -	\$ -	0%	
<b>Total Variable Cost</b>				<b>\$ 24,678.30</b>	<b>\$ 67,606.60</b>	<b>\$ 2.65</b>	<b>71%</b>	

Overhead Costs		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost
Repair & maintenance	\$/month	\$ 100.00	12	NA	\$ 1,200.00	\$ 0.05	1%
Insurance	\$/yr	\$ 1,000.00			\$ 1,000.00		1%
Administration/Management - legal fees, professional services, etc.	% of TVC	5%	NA	\$ 1,233.92	\$ 3,380.33	\$ 0.13	4%
<b>Other</b>	\$	\$ -					
<b>Total Overhead Costs</b>				\$ 1,233.92	\$ 5,580.33	\$ 0.22	102%

*Annual capital costs calculation assumes a straight line depreciation*  
*All capital costs are incurred beginning of year 1*

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost/cycle	% of total cost
Feeder blower	unit	\$ 5,000.00	1	\$ 5,000.00	8	\$ -	\$ 625.00	\$ 312.50	1%
Storage Shed	unit	\$ 4,500.00	1	\$ 4,500.00	10	\$ 450.00	\$ 405.00	\$ 202.50	0%
Electrical aerators	unit	\$ 200.00	6	\$ 1,200.00	5	\$ 120.00	\$ 216.00	\$ 108.00	0%
Emergency Generator	unit	\$ 1,000.00	1	\$ 1,000.00	10	\$ 100.00	\$ 90.00	\$ 45.00	0%
Well & motor	unit	\$ 12,000.00	1	\$ 12,000.00	20	\$ 1,200.00	\$ 540.00	\$ 270.00	1%
Tractor (50 HP)	unit	\$ 17,500.00	1	\$ 17,500.00	10	\$ 1,750.00	\$ 1,575.00	\$ 787.50	2%
Misc (waders, scale, test equip)	unit	\$ 2,000.00	1	\$ 2,000.00	5	\$ 200.00	\$ 360.00	\$ 180.00	0%
Pond construction	unit	\$ 5,000.00	6	\$ 30,000.00	30	\$ 3,000.00	\$ 900.00	\$ 450.00	1%
Drainage, piping, installations, gravel etc	unit	\$ 3,500.00	1	\$ 3,500.00	20	\$ 350.00	\$ 157.50	\$ 78.75	0%
<b>Other 1</b>	\$	\$ -		\$ -	1	\$ -	\$ -	\$ -	0%
<b>Other 2</b>	\$	\$ -		\$ -	1	\$ -	\$ -	\$ -	0%
<b>Total Capital Costs</b>				\$ 76,700.00			\$ 4,868.50	\$ 2,434.25	5%

Loan Information	Years	Interest Rate	Loan Balance	Cost/year	Cost/cycle	% of total cost
<b>Capital</b>	7	7.00%	\$ 76,700.00	\$ 14,231.93	\$ 7,115.97	15%
<b>Truck</b>	5	7.00%	\$ 12,000.00	\$ 2,926.69	\$ 487.78	3%
<b>Loan 3</b>	0	0.00%	\$ -	\$ -	\$ -	0%
<b>Loan 4</b>	0	0.00%	\$ -	\$ -	\$ -	0%
<b>Total Loan Costs</b>			\$ 88,700.00	\$ 17,158.62	\$ 7,603.75	18%

Summary	Value/cycle	Value/year	Value/acre	% of total cost
<b>Total Receipts</b>	\$ 59,925.00	\$ 119,850.00	\$ 29,962.50	
<b>Total Variable Costs</b>	\$ 24,678.30	\$ 67,606.60	\$ 12,339.15	83%
<b>Total Overhead Costs</b>	\$ 1,233.92	\$ 5,580.33	\$ 616.96	7%
<b>Average Interest Paid</b>	\$ 1,825.50	\$ 3,651.00	\$ 3,801.87	4%
<b>Depreciation</b>	\$ 2,434.25	\$ 4,868.50	\$ 1,217.13	6%
<b>Total Cost</b>	\$ 30,171.96	\$ 81,706.43	\$ 17,975.11	100%
<b>Net Revenue above Variable/Overhead Costs</b>	\$ 34,012.79	\$ 46,663.07	\$ 17,006.39	
<b>Net Revenue above Total Costs</b>	\$ 29,753.04	\$ 38,143.57	\$ 11,987.39	
<b>Breakeven Price with variable/overhead cost</b>	/lb	\$ 2.87		
<b>Breakeven Price with total cost</b>	/lb	\$ 3.20		

**INCOME STATEMENT**  
**Year Ending**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>REVENUE</b>						
Fish Sales	\$ -	\$ 59,925.00	\$ 119,850.00	\$ 119,850.00	\$ 119,850.00	\$ 119,850.00
Other Income	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Gross Revenue</b>	<b>\$ -</b>	<b>\$ 59,925.00</b>	<b>\$ 119,850.00</b>	<b>\$ 119,850.00</b>	<b>\$ 119,850.00</b>	<b>\$ 119,850.00</b>
<b>EXPENSES</b>						
Operating Expenses	\$ 54,166.93	\$ 69,853.18	\$ 73,186.93	\$ 73,186.93	\$ 73,186.93	\$ 73,186.93
Depreciation	\$ 4,868.50	\$ 4,868.50	\$ 4,868.50	\$ 4,868.50	\$ 4,868.50	\$ 4,868.50
Interest	\$ 6,209.00	\$ 5,442.53	\$ 4,622.40	\$ 3,744.86	\$ 2,805.90	\$ 1,801.21
<b>Total Expenses</b>	<b>\$ 65,244.43</b>	<b>\$ 80,164.21</b>	<b>\$ 82,677.83</b>	<b>\$ 81,800.29</b>	<b>\$ 80,861.33</b>	<b>\$ 79,856.64</b>
<b>Net Farm Income from Operations</b>	<b>\$ (65,244.43)</b>	<b>\$ (20,239.21)</b>	<b>\$ 37,172.17</b>	<b>\$ 38,049.71</b>	<b>\$ 38,988.67</b>	<b>\$ 39,993.36</b>
Gain/Loss on Sale of Capital Assets						
<b>NET FARM INCOME</b>	<b>\$ (65,244.43)</b>	<b>\$ (20,239.21)</b>	<b>\$ 37,172.17</b>	<b>\$ 38,049.71</b>	<b>\$ 38,988.67</b>	<b>\$ 39,993.36</b>

**RECIRCULATING AQUACULTURE SYSTEM**

The budget presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

**You should change the cells in yellow with blue font to reflect your situation.**

Choose the fish species from the drop down menu: Yellow Perch

System Parameters		
Number of production phases	number	3
Phase 1 number of days (nursery)	days	65
Phase 2 number of days (fingerling)	days	150
Phase 3 number of days (growout)	days	150
Average # of days/phase	days/phase	122
Length of Production cycle	days	365
Number of production cycles per year	number	3
Expected annual production	lb	37,973
Overall survival rate	%	77%
Market size	lb	0.33
Kwh per lb of production	kwh/ lb prod.	1.50
Chemicals	\$/cycle	\$ 200.00

*Leave cell blank if you are not including this phase*

Capital Investment Costs		Unit Cost	Number	Cost	Yrs of use	Salvage value	Yearly cost
Land	unit		1	\$ -	30	\$ -	\$ -
Building: Pole barn with concrete floor	unit	\$ -	1	\$ -	30	\$ -	\$ -
Complete RAS System	unit	\$ 150,000.00	1	\$ 150,000.00	10	\$ 15,000.00	\$ 13,500.00
Construction labor & overhead	unit		1	\$ -	5	\$ -	\$ -
Settling pond	unit		1	\$ -	10	\$ -	\$ -
Emergency Generator	unit	\$ 5,000.00	1	\$ 5,000.00	10	\$ 500.00	\$ 450.00
Transport tank	unit	\$ 1,000.00	1	\$ 1,000.00	10	\$ 100.00	\$ 90.00
Blower	unit	\$ 2,000.00	1	\$ 2,000.00	5	\$ 200.00	\$ 360.00
Well & motor	unit	\$ 20,000.00	1	\$ 2,500.00	20	\$ 1.00	\$ 124.95
equipment, purge tanks, buckets etc)	unit	\$ 2,500.00	1	\$ 2,500.00	5	\$ 250.00	\$ 450.00
Miscellaneous labor (installation of system, utilities, plumbing, etc)	\$			\$ 5,000.00	20	\$ -	\$ 250.00
<b>Total Capital Investment</b>							<b>\$ 15,224.95</b>



Write down stocking months	April	May	June			
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Operating parameters per production phase		Phase 1 (nursery)	Phase 2 (fingerlings)	Phase 3 (growout#1)	Cycle Total	Annual Total
Water volume	gal	4,000	6,000	12,000		
Size stocked	lb	0.003	0.06	0.13		
Size harvested	lb	0.06	0.13	0.33		
Survival rate	%	85%	95%	95%		
Feed cost	\$/lb	\$ 0.50	\$ 0.45	\$ 0.45		
Feed conversion	ratio	1.40	1.30	1.30		
Beginning number of fish	number	50,000	42,500	40,375	50,000	150,000
Ending number of fish	number	42,500	40,375	38,356	38,356	115,069
Beginning biomass	lb	150	2,550	5,249	150	450
Ending biomass	lb	2,550	5,249	12,658	12,658	37,973
Maximum standing biomass	lb/gal	0.64	0.87	1.05		
Feed used	lb	3,360	3,508	9,631	16,500	49,499
Kwh used	kwh	3,866.35	4,037	11,083	18,986	56,959.03
Oxygen used	\$/ 100 cubic feet	12,146	12,683	34,818	59,647	178,941

*Use only female fingerlings to obtain higher survival*

Operating costs	unit	cost/unit	quantity/cycle	\$/cycle	\$/year	\$ per lb of fish	% of total
<b>Variable Cost</b>							
Fingerlings	\$/piece	\$ 0.30	50,000	\$ 15,000	\$ 45,000	\$ 1.19	30%
Feed (wt avg)	\$/lb	\$ 0.46	16,500	\$ 7,593	\$ 22,779	\$ 0.60	15%
Electricity	\$/kwh	\$ 0.10	18,986	\$ 1,899	\$ 5,696	\$ 0.15	4%
Oxygen	\$/ 100 cu feet	\$ 0.10	596	\$ 60	\$ 179	\$ 0.00	0%
Chemicals	\$ per cycle	\$ 800.00	1	\$ 800	\$ 2,400	\$ 0.06	2%
Hired labor	\$/hour	\$ 10.00	200	\$ 2,000	\$ 6,000	\$ 0.16	4%
Tansportation cost of fingerlings	\$/lb	\$ -	50,000	\$ -	\$ -	\$ -	0%
Tansportation cost to Market	\$/lb	\$ -	37,973	\$ -	\$ -	\$ -	0%
Miscellaneous	\$	\$ 500.00	1	\$ 500	\$ 1,500	\$ 0.04	1%
<b>Total variable cost</b>				<b>\$ 27,851</b>	<b>\$ 83,554</b>	<b>\$ 2.20</b>	<b>55%</b>

<b>Overhead Cost</b>							
Oxygen tank rental		\$ 750.00	1	\$ 3,000	\$ 9,000	\$ 0.08	6%
Electrical demand charge		\$ 100.00	1	\$ 400	\$ 1,200	\$ 0.01	1%
Maintenance (3% of cap inv)	3%	\$ 1,827	1	\$ 1,827	\$ 5,481	\$ 0.05	4%
Insurance	3% of TCI	10%			\$ 1,522		
Adminstration/Management - legal fees, professional services, etc. (% of total overhead)	5% of TVC	5%			\$ 4,178	\$ 0.04	3%
<b>Other</b>					\$ -	\$ -	0%
<b>Total overhead cost</b>				\$ 5,227	\$ 21,381	\$ 0.17	14%

<b>Loan Information</b>	<b>Years</b>	<b>Interest Rate</b>	<b>Loan Balance</b>	<b>Cost per year</b>	<b>Cost per cycle</b>	
<b>Capital</b>	5	9.00%	\$ 180,500.00	\$ 46,405.19	\$ 15,468.40	31%
<b>Loan 2</b>	0	0.00%	\$ -	\$ -	\$ -	0%
<b>Loan 3</b>	0	0.00%	\$ -	\$ -	\$ -	0%
<b>Loan 4</b>	0	0.00%	\$ -	\$ -	\$ -	0%
<b>Total loan cost</b>			\$ 180,500.00	\$ 46,405.19	\$ 15,468.40	31%

<b>Gross Receipts</b>	<b>unit</b>	<b>cost/unit</b>	<b>quantity/cycle</b>	<b>\$/cycle</b>	<b>\$/year</b>	<b>\$/lb</b>
Fish sale	lb	\$ 3.00	12,658	\$ 37,973	\$ 113,918	\$ 1.00
Miscellaneous Receipts	\$	\$ -		\$ -	\$ -	\$ -
<b>Total receipts</b>				\$ 37,973	\$ 113,918	\$ 1.00

<b>Summary</b>		<b>Value/cycle</b>	<b>Value/year</b>	<b>\$/lb</b>
<b>Total Receipts</b>		\$ 37,972.69	\$ 113,918.06	\$ 1.00
<b>Total Variable Costs</b>		\$ 27,851.21	\$ 83,553.62	\$ 2.20
<b>Total Overhead Costs</b>		\$ 5,226.99	\$ 21,381.16	\$ 0.17
<b>Average Interest Paid</b>		\$ 3,435.06	\$ 10,305.19	\$ 0.09
<b>Depreciation</b>		\$ 5,074.98	\$ 15,224.95	\$ 0.13
<b>Total Cost</b>		\$ 41,588.25	\$ 130,464.91	2.60
<b>Net Revenue above Variable &amp; Overhead Costs</b>	\$	\$ 4,894.49	\$ 8,983.29	\$ (1.37)
<b>Net Revenue above Total Costs</b>	\$	\$ (3,615.56)	\$ (16,546.85)	\$ (1.60)
<b>Breakeven Price with variable/overhead cos</b>	/lb	\$ 2.61		
<b>Breakeven Price with total cost</b>	/lb	\$ 3.29		

**CAGE CULTURE**

The budget template presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

**You should change the cells in yellow with blue font to reflect your situation.**

Choose the fish species from the drop down menu:

**Hybrid Striped Bass**

Variables	Unit	Value	
Length of production	month		<i>time from fingerling to harvest</i>
Number of cycles/fish stockings in a year	#/yr		<i>number of times you wish to harvest/stock in a year for continuous production</i>
Number of cages harvested per cycle	cages/cycle		<i>number of cages you wish to harvest/stock at one time</i>
Total number of cages needed	cages		
Minimum water surface acreage needed	acres		Based on max fish production of 5K lb/ac/year
Cage Shape		<b>Rectangular</b>	<i>choose the cage size from the drop down menu</i>
Cage Dimensions			
	Diameter		
	Length		
	Width		
	Height		
Individual Cage Volume	gals		<i>volume is calculated allowing a foot above water surface</i>
Stocking density/cage	/cage		<i>stocking rate is calculated as a lb fish at market per gallon of water</i>
Fingerling size (5")	lb		<i>assumes 1,000 5"-fingerlings weigh 30lb</i>
Harvest size	lb		
Feed Conversion Ratio (FCR)			
Survival	%		<i>% of fish that survives until harvest</i>

Gross Receipts:		\$/unit	quantity / cycle	\$/cycle	\$/year
Fish sale	\$/lb	\$ -		\$ -	\$ -
Miscellaneous Receipts	\$/lb	\$ -		\$ -	\$ -
<b>Total Receipts</b>				<b>\$ -</b>	<b>\$ -</b>

**Write down stocking months**

Variable Inputs:		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost
Fingerlings	\$	\$ -		\$ -	\$ -		
Feed	\$/lb	\$ -		\$ -	\$ -		
Chemicals	\$/cage	\$ -		\$ -	\$ -		
Electricity cost for aeration	\$/kwh	\$ -		\$ -	\$ -		assumes 24 hr continuous aeration from Mav-Sen
Hired Labor - Hours	\$/hr	\$ -			\$ -		
Harvesting	\$/lb	\$ -		\$ -	\$ -		
Transportation Costs of Fingerlings	\$/fish	\$ -		\$ -	\$ -		
Transportation Costs to Market	\$/lb	\$ -		\$ -	\$ -		
Miscellaneous	\$/cage	\$ -		\$ -	\$ -		
<b>Other</b>	\$	\$ -		\$ -	\$ -		
<b>Total Variable Cost</b>				\$ -	\$ -		<b>0%</b>

Overhead Costs		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost
Repair and Maintenance	\$/lb	\$ -		\$ -	\$ -		
Water acres rental	\$/acre	\$ -			\$ -		assumes a rental or opportunity cost for use of lake/large pond
Insurance	\$/yr	\$ -			\$ -		
Adminstration/Management - legal fees, professional services, etc.	% of TVC			\$ -	\$ -		assumes a % of Total Variable Cost
<b>Other 1</b>	\$	\$ -					
<b>Other 2</b>	\$	\$ -					
<b>Total Overhead Costs</b>				\$ -	\$ -		<b>0%</b>

**Annual capital costs calculation assumes a straight line depreciation**  
**All capital costs are incurred beginning of year 1**

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost / cycle	% of total cost
Feeders	unit	\$ -		\$ -		\$ -			
Storage Shed	unit	\$ -		\$ -		\$ -			
Electrical aerator (or air lifts)	unit	\$ -		\$ -		\$ -			
Emergency Generator	unit	\$ -		\$ -		\$ -			
Transport tank	unit	\$ -		\$ -		\$ -			
Mower	unit	\$ -		\$ -		\$ -			
Misc (waders, scale, test equip)	unit	\$ -		\$ -		\$ -			
Cages	unit	\$ -		\$ -		\$ -			
Dock/Boat	unit	\$ -		\$ -		\$ -			
Other 1	\$	\$ -		\$ -		\$ -			
Other 2	\$	\$ -		\$ -		\$ -			
<b>Total Capital Costs</b>				\$ -		\$ -		\$ -	

Loan Information	Years	Interest Rate	Loan Balance	Cost / year	Cost / cycle	cost
Capital	0		\$ -	\$ -		
Truck	0		\$ -	\$ -		
Loan 3	0		\$ -	\$ -		
Loan 4	0		\$ -	\$ -		
<b>Total Loan Costs</b>			\$ -	\$ -	\$ -	

Summary	Value/cycle	Value/year	Value/cage	% of total cost
Total Receipts	\$ -	\$ -		
Total Variable Costs	\$ -	\$ -		
Total Overhead Costs	\$ -	\$ -		
Average Interest Paid	\$ -	\$ -		
Depreciation	\$ -	\$ -		
<b>Total Cost</b>	\$ -	\$ -		
Net Revenue above Variable/Overhead Costs	\$ -	\$ -	\$ -	
Net Revenue above Total Costs	\$ -	\$ -	\$ -	
Breakeven Price with variable/overhead cost	/lb			
Breakeven Price with total cost	/lb			

**POND CULTURE**

The budget template presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

**You should change the cells in yellow with blue font to reflect your situation.**

Choose the fish species from the drop down menu: Large Mouth Bass

Variables	Unit	Value	
Length of production	month		<i>time from fingerling to harvest</i>
Number of cycles/fish stockings in a year	#/yr		<i>number of times you wish to harvest/stock in a year for continuous production</i>
Number of ponds harvested per cycle	ponds/cycle		<i>number of ponds you wish to harvest/stock at one time</i>
Total number of ponds needed	ponds		
Pond size	acre		<i>pond size of 0.5 to 5 acres recommended</i>
Stocking density	/acre		<i>stocking rate depends on the species</i>
Fingerling size (6")	lb		<i>assumes 1,000 6"-fingerlings weigh 35lb</i>
Harvest size	lb		
Feed Conversion Ratio (FCR)			
Survival	%		<i>% of fish that survives until harvest</i>

Gross Receipts:		\$/unit	quantity / cycle	\$/cycle	\$/year
Fish sale	\$/lb	\$ -		\$ -	\$ -
Miscellaneous Receipts	\$/lb	\$ -		\$ -	\$ -
<b>Total Receipts</b>				\$ -	\$ -

Variable Inputs:		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost
Fingerlings	\$	\$ -		\$ -	\$ -		
Feed	\$/lb	\$ -		\$ -	\$ -		
Chemicals	\$/acre	\$ -		\$ -	\$ -		
Electricity cost for aeration	\$/kwh	\$ -		\$ -	\$ -		<i>24 hr aerat'n from May-Sep</i>
Hired Labor - Hours	\$/hr	\$ -		\$ -	\$ -		<i>20 hrs / wk / person</i>
Harvesting	\$/lb	\$ -		\$ -	\$ -		
Transportation Cost of Fingerlings	\$/fish	\$ -		\$ -	\$ -		
Transportation Cost to Market	\$/lb	\$ -		\$ -	\$ -		
Miscellaneous	\$/acre	\$ -		\$ -	\$ -		
<b>Other</b>	\$	\$ -		\$ -	\$ -		
<b>Total Variable Cost</b>				\$ -	\$ -		

**Write down stocking months**

Overhead Costs		\$/unit	quantity / cycle	\$/cycle	\$/year	\$/lb/yr	% of total cost
Repair & maintenance	\$/month				\$ -		
Insurance	\$/yr				\$ -		
Administration/Management - legal fees, professional services, etc.	% of TVC			\$ -	\$ -		
Other	\$						
<b>Total Overhead Costs</b>				\$ -	\$ -		

*Annual capital costs calculation assumes a straight line depreciation*  
*All capital costs are incurred beginning of year 1*

Capital Costs		Cost	Number	Total cost	Yrs of use	Salvage value	Cost/year	Cost/cycle	% of total cost
Feeder blower	unit	\$ -		\$ -		\$ -			
Storage Shed	unit	\$ -		\$ -		\$ -			
Electrical aerators	unit	\$ -		\$ -		\$ -			
Emergency Generator	unit	\$ -		\$ -		\$ -			
Well & motor	unit	\$ -		\$ -		\$ -			
Tractor (50 HP)	unit	\$ -		\$ -		\$ -			
Misc (waders, scale, test equip)	unit	\$ -		\$ -		\$ -			
Pond construction	unit	\$ -		\$ -		\$ -			
Drainage, piping, installations, gravel etc	unit	\$ -		\$ -		\$ -			
Other 1	\$	\$ -		\$ -		\$ -			
Other 2	\$	\$ -		\$ -		\$ -			
<b>Total Capital Costs</b>				\$ -		\$ -	\$ -	\$ -	0%

Loan Information		Years	Interest Rate	Loan Balance	Cost/year	Cost/cycle	% of total cost
Capital		0		\$ -	\$ -		
Truck		0		\$ -	\$ -		
Loan 3		0		\$ -	\$ -		
Loan 4		0		\$ -	\$ -		
<b>Total Loan Costs</b>				\$ -	\$ -		

Summary		Value/cycle	Value/year	Value/acre	% of total cost
Total Receipts	\$	\$ -	\$ -		
Total Variable Costs	\$	\$ -	\$ -		
Total Overhead Costs	\$	\$ -	\$ -		
Average Interest Paid	\$				
Depreciation	\$	\$ -	\$ -		
<b>Total Cost</b>	\$	\$ -	\$ -		
Net Revenue above Variable/Overhead Costs	\$	\$ -	\$ -		
Net Revenue above Total Costs	\$	\$ -	\$ -	\$ -	
Breakeven Price with variable/overhead cost	/lb				
Breakeven Price with total cost	/lb				

**RECIRCULATING AQUACULTURE SYSTEM**

The budget template presented below is a guide to assist you in projecting costs and returns for your aquaculture enterprise. It is to be used for planning your aquaculture operation and developing a budget specific to your situation.

**You should change the cells in yellow with blue font to reflect your situation.**

Choose the fish species from the drop down menu:

**Yellow Perch**

System Parameters		
Number of production phases	number	
Phase 1 number of days (nursery)	days	
Phase 2 number of days (fingerling)	days	
Phase 3 number of days (growout)	days	
Average # of days/phase	days/phase	
Length of Production cycle	days	
Number of production cycles per year	number	
Expected annual production	lb	
Overall survival rate	%	
Market size	lb	
Kwh per lb of production	kwh/ lb prod.	
Chemicals	\$/cycle	

*Leave cell blank if you are not including this phase*

Capital Investment Costs		Unit Cost	Number	Cost	Yrs of use	Salvage value	Yearly cost
Land	unit	\$ -		\$ -		\$ -	
Building: Pole barn with concrete floor	unit	\$ -		\$ -		\$ -	
Complete RAS System	unit	\$ -		\$ -		\$ -	
Construction labor & overhead	unit	\$ -		\$ -		\$ -	
Settling pond	unit	\$ -		\$ -		\$ -	
Emergency Generator	unit	\$ -		\$ -		\$ -	
Transport tank	unit	\$ -		\$ -		\$ -	
Blower	unit	\$ -		\$ -		\$ -	
Well & motor	unit	\$ -		\$ -		\$ -	
equipment, purge tanks, buckets etc)	unit	\$ -		\$ -		\$ -	
Miscellaneous labor (installation of system, utilities, plumbing, etc)	\$	-		\$ -		\$ -	
<b>Total Capital Investment</b>		\$ -					



Write down stocking months

Operating parameters per production phase		Phase 1 (nursery)	Phase 2 (fingerlings)	Phase 3 (growout#1)	Cycle Total	Annual Total
Water volume	gal	-	-	-		
Size stocked	lb					
Size harvested	lb					
Survival rate	%					
Feed cost	\$/lb	\$ -	\$ -	\$ -		
Feed conversion	ratio					
Beginning number of fish	number	-	-	-	-	-
Ending number of fish	number	-	-	-	-	-
Beginning biomass	lb	-	-	-	-	-
Ending biomass	lb	-	-	-	-	-
Maximum standing biomass	lb/gal					
Feed used	lb					
Kwh used	kwh					
Oxygen used	\$ / 100 cubic feet	0	0	0	-	-

Use only female fingerlings to obtain higher survival

Operating costs	unit	cost/unit	quantity/cycle	\$/cycle	\$/year	\$ per lb of fish	% of total
<b>Variable Cost</b>							
Fingerlings	\$/piece	\$ -	-	\$ -	\$ -		
Feed (wt avg)	\$/lb		-	\$ -	\$ -		
Electricity	\$/kwh	\$ -	-	\$ -	\$ -		
Oxygen	\$ / 100 cu feet	\$ -	-	\$ -	\$ -		
Chemicals	\$ per cycle			\$ -	\$ -		
Hired labor	\$/hour	\$ -		\$ -	\$ -		
Transportation cost of fingerlings	\$/lb	\$ -	-	\$ -	\$ -		
Transportation cost to Market	\$/lb	\$ -	-	\$ -	\$ -		
Miscellaneous	\$	\$ -		\$ -	\$ -		
<b>Total variable cost</b>				\$ -	\$ -		

Overhead Cost						
Oxygen tank rental		\$ -			\$ -	
Electrical demand charge		\$ -			\$ -	
Maintenance (3% of cap inv)	0%			\$ -	\$ -	
Insurance	3% of TCI				\$ -	
Adminstration/Management - legal fees, professional services, etc. (% of total overhead)	5% of TVC				\$ -	
<b>Other</b>					\$ -	
<b>Total overhead cost</b>				\$ -	\$ -	\$ -

Loan Information	Years	Interest Rate	Loan Balance	Cost per year	Cost per cycle
Capital	0		\$ -	\$ -	
Loan 2	0		\$ -	\$ -	
Loan 3	0		\$ -	\$ -	
Loan 4	0		\$ -	\$ -	
<b>Total loan cost</b>			\$ -	\$ -	\$ -

Gross Receipts	unit	cost/unit	quantity/cycle	\$/cycle	\$/year	\$/lb
Fish sale	lb	\$ -	-	\$ -	\$ -	
Miscellaneous Receipts	\$	\$ -		\$ -	\$ -	
<b>Total receipts</b>				\$ -	\$ -	\$ -

Summary		Value/cycle	Value/year	\$/lb
<b>Total Receipts</b>		\$ -	\$ -	\$ -
<b>Total Variable Costs</b>		\$ -	\$ -	\$ -
<b>Total Overhead Costs</b>		\$ -	\$ -	\$ -
<b>Average Interest Paid</b>				
<b>Depreciation</b>			\$ -	
<b>Total Cost</b>		\$ -	\$ -	\$ -
<b>Net Revenue above Variable &amp; Overhead Costs</b>	\$	\$ -	\$ -	\$ -
<b>Net Revenue above Total Costs</b>	\$	\$ -	\$ -	\$ -
<b>Breakeven Price with variable/overhead cos</b>	/lb			
<b>Breakeven Price with total cost</b>	/lb			