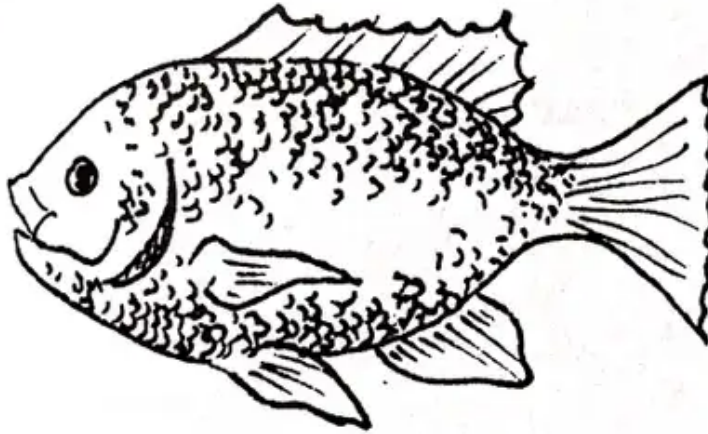

Fish

- Dry Fishponds Become Oases of Productivity (<https://www.echocommunity.org/resources/d5948dea-2fb6-4936-be64-7f9fb0be29c0#DryF>)
- Auburn University is Exceptionally Supportive of PVO Work in Aquaculture (<https://www.echocommunity.org/resources/d5948dea-2fb6-4936-be64-7f9fb0be29c0#Aubu>)
- Consulting Help in Water Resource Management, Fisheries and Aquaculture (<https://www.echocommunity.org/resources/d5948dea-2fb6-4936-be64-7f9fb0be29c0#Cons>)
- New Bulletin Series: Water Harvesting and Aquaculture for Rural Development (<https://www.echocommunity.org/resources/d5948dea-2fb6-4936-be64-7f9fb0be29c0#NewB>)
- Book Review: *How to Grow Fish in the Mountains* (<https://www.echocommunity.org/resources/d5948dea-2fb6-4936-be64-7f9fb0be29c0#BookRev>)
- The Institute of Aquaculture (<https://www.echocommunity.org/resources/d5948dea-2fb6-4936-be64-7f9fb0be29c0#TheI>)

DRY FISHPONDS BECOME OASES OF PRODUCTIVITY. (Excerpted from *Spore* August 1994, p. 12.) "Fishponds are a relatively new innovation for farmers in Malawi. ... [During the 1992 drought] farmers with fishponds were able to harvest the fish before the ponds dried out. ... the farmers were then able to plant vegetables in the pond. This gave them an extra crop when other farmers were unable to grow anything." (https://cdn.ymaws.com/echocommunity.site-ym.com/resource/resmgr/a_to_z/azch9bee.htm#Tab1)

AUBURN UNIVERSITY IS EXCEPTIONALLY SUPPORTIVE OF PVO WORK IN AQUACULTURE. I spent a stimulating (/resources/e708ccab-c900-4d55-9d76-e3ea4c57fae1) week at Auburn University's International Aquaculture Program. I have never seen such a concentration of both faculty and graduate students who were **eager** for opportunities to help private voluntary organizations (PVO's) with aquaculture problems and opportunities! Auburn will assist you with technical information, ideas from their development experiences, and even "tailoring" training for visitors or requesters.

They offer an annual eight-week aquaculture training program (in 1995 it was July-September). The comprehensive course is designed for fisheries technicians and administrators, as well as for those who practice aquaculture with PVOs. The emphasis is on practical experience and techniques appropriate for developing countries. Cost in 1995 was \$4000 plus living expenses. Write to ATP Coordinator,



Department of
Fisheries and Allied
Aquacultures,
Auburn University,
AL 36849-5419
USA; phone
205/844-4786; fax
205/844-9208. If
you are looking for
staff with expertise
in this area, you may
also want to
mention your need
to Dr. Bryan Duncan

of the International Center for Aquaculture at Auburn University; he may be able to refer some graduate students to assist you in your project.

(https://cdn.ymaws.com/echocommunity.site-ym.com/resource/resmgr/a_to_z/azch9bee.htm#Tab1)

CONSULTING HELP IN WATER RESOURCE MANAGEMENT, FISHERIES AND AQUACULTURE. The Auburn University staff are exceptionally knowledgeable about third world applications in these areas and have been ready to help with technical information.

Living Water International (LWI) started with Auburn scientists. Dr. Bryan Duncan writes that LWI "is an association of specialists in water resource management, fisheries and aquaculture. LWI was founded to provide information and technical assistance to Christian missions, and similar humanitarian organizations with limited resources working in developing countries. LWI associates hold graduate degrees in their specialties, and are experienced in working and living internationally.

"Specialists are qualified in the following: aquacultural production; freshwater capture fisheries; aquatic ecology and environmental assessment; site assessment and design of aquacultural facilities; harvesting and storage of surface water for multiple use; water quality; integration of agriculture and aquaculture; project feasibility, design, implementation and evaluation; education and training.

"LWI provides services, rather than funding, to other organizations. LWI may be approached directly by organizations desiring assistance, and a response will be tailored where possible to meet the needs and resources of the requesting organization. Write Living Water International, 805 Cary Drive, Auburn, AL 36830, USA." (https://cdn.ymaws.com/echocommunity.site-ym.com/resource/resmgr/a_to_z/azch9bee.htm#Tab1)

NEW BULLETIN SERIES: WATER HARVESTING AND AQUACULTURE FOR RURAL DEVELOPMENT. The Water Harvesting/Aquaculture Project (WH/AP) at Auburn University has designed this new series primarily for development workers and extensionists with little or no prior experience in the area. The booklets are very practical with a writing style that is easy (/resources/cda376f1-fd28-4a87-aeff-bb35e2216a94)to read and not overly technical (about half the information is presented in diagrams and illustrations). All are available in English, French, and Spanish.

The series contains 20 booklets so far. **General manuals** include: Transporting fish, Feeding your fish, Intro. to water harvesting, Eliminating unwanted fish and harmful insects from fish ponds, Intro. to polyculture of fish, Intro. to fish culture in ponds, Intro. to aquaculture, Fish culture in rice paddies, and Intro. to intensive cage



culture of warmwater fish. **Fertilization manuals** are: Intro. to fish pond fertilization and Chemical/Organic fertilizers for fish ponds. **Tilapia manuals** include: Intro. to Tilapia, Reproductive biology of *Oreochromis niloticus*, Intro. to *Oreochromis niloticus* fry and fingerling production systems, Net enclosure system for *Oreochromis niloticus* fry and fingerling production, Production of mixed-sex *Oreochromis niloticus* fingerlings in earthen ponds, Culture of hand-sexed male tilapia, Single pond system for sustainable production of *Oreochromis niloticus*, and *Oreochromis niloticus* production in tanks.

We will share one helpful hint mentioned in the manual "Transporting fish." A key to success is, of course, to have plenty of oxygen in the container. If it is necessary to have very many fish in the transporting container, or if the trip is unusually long, the oxygen added at the pickup point (if any) may become exhausted. But if you can purchase hydrogen peroxide, which is widely available around the world in pharmacies, you can actually generate oxygen.

Dip a 2 liter plastic bag (26 x 26 cm) in clean water several times to get it wet, then shake to remove excess water. Place 1 gram of fish liver in the bag then crush it by hand. Add 40 ml of 6% by weight hydrogen peroxide, then quickly expel all the air and seal the bag with an elastic band and shake it. Within 5 minutes the bag will be filled with oxygen. Use a tube to connect the oxygen bag with the transport bag and squeeze to transfer the oxygen. Do not squeeze liquid from the oxygen bag as it may kill fish. If the transport bag is not completely filled, use a tire pump to finish filling it.

If none of this is possible, you should at least periodically bubble air through the container using a tire pump.

WH/AP intends to continue the series with new booklets being published and old ones updated as long as funding allows. Brochures are free of charge, although you may be charged for postage. (Specify language preference.) The brochures are also available on floppy disk in MacIntosh format. They ask that development

workers interested in obtaining copies have their field office write, listing the particular titles wanted, to Dr. Bryan Duncan, International Center for Aquaculture, Auburn University, AL 36849-5419, USA.

HOW TO GROW FISH IN THE MOUNTAINS is by Joe Richter, a missionary-biologist with FARMS in the Philippines. He wrote this book for the farmer and has done a good job of keeping it simple yet covering a great deal of practical information. Every one of its 37 pages is illustrated with one or more drawings. Topics covered are: why grow fish; common cultured fish; pond construction; fingerlings and their production; sexing brood fish; predators; fertilizing and feeding; integrated fish farming; harvesting; and common mistakes in growing fish. You may order the book from ECHO (\$5 including postage). Here are some excerpts.

A simple test will determine if your pond site will hold water. "Dig several holes, a bit deeper than your intended pond bottom. Fill with water and observe. If the water still disappears after several fillings, the site may not be suitable for a pond. But if the water remains in the holes the soil is suitable for a pond." Because of the danger of theft, "submerged wire firmly staked into the pond bottom will hinder fishing and netting. Barbed wire may be necessary." Are all fingerlings of good quality? "No! ...inbreeding (breeding between relatives) will produce poor quality fingerlings. Inbreeding is a problem in using fingerlings from your own pond, because some of your original stock will be related to each other. [Avoid] stunted fingerlings, fish that may be several months old but still are very small due to lack of food in the pond they came from. They may be already sexually mature and will quickly reproduce and fill your pond with unwanted fingerlings. These stunted fish will grow very slowly." Farmers in the mountains should produce their own fingerlings. "You will need a 1/2 meter deep brood pond that is easy to net and to drain. Initial brood fish need to come from a reliable hatchery. Stock one male for every three females. Stock at a rate of 200 kilograms of brood fish per hectare (e.g. 40 fish weighing 50 grams in 100 square meters)."

"For every kilogram of fish in your pond you can add 80-160 grams of wet manure daily. If your manure is dry, add only 20-40 grams." "Sunny days are best for manure application. The morning is the best time to manure, so the nutrients can be used during the sunny part of the day. Afternoon application can cause a loss of oxygen during the night which can kill the fish." "How do I know when I am fertilizing enough? An easy test is to bend over and place your hand under the water. If your hand disappears before your elbow reaches the water, the pond has enough fertilizer. You should never be able to see the pond bottom." "Carp will eat some of your fingerlings and may allow your tilapia to grow to a larger size."

(https://cdn.ymaws.com/echocommunity.site-ym.com/resource/resmgr/a_to_z/azch9bee.htm#Tab1)

THE INSTITUTE OF AQUACULTURE at the University of Stirling, Scotland, is a resource center which concentrates on nutrition, reproduction and genetics, disease, and environmental studies in aquaculture. They offer many (commercial) consultancy services. The Institute offers studies through the doctoral level, as well as several short courses. You may inquire about their publications and services at: Institute of Aquaculture, University of Stirling, Stirling FK9 4LA, Scotland, UK.