

Shrimp farming in the Gambia

Janet H Brown reports

Shrimp farms can have their own beauty but mostly of the moonscape type, attractive by virtue of silence and absence of buildings. A farm where you can photograph crocodiles and marvel at the variety of birdlife, pelicans, egrets, kingfishers and wonderfully coloured birds whose names I don't know, is a little out of the common run. The shrimp farm I visited in September last year, West Africa Aquaculture (WAA), was even more unusual as the only shrimp farm operating in West Africa.

I was there as part of a Sahel and West Africa Club (SWAC)/OECD/World Bank project, "Joint Regional Study on Market Led Opportunities; Development in Shrimp Farming". It was a fascinating opportunity since I had known the first manager of the farm, Jan Ooms, when it was first operational in the late 1980s, established by ScanGambia. I had also more recently (within last 2 years) had a phone call from a lady enquiring about growing *Penaeus monodon* in the Gambia. When I had asked where she was planning to obtain her stock and she had replied that she would get it offshore in the Gambia I was so sure she was mistaken, our conversation didn't go much further at that time. This however was Margot Hansson, who with her husband Lennart Hansson had been granted the lease on the shrimp farm site, derelict for nearly 10 years. As soon as I had been given the consultancy task I delved for my diary to unearth the contact details for this farm and the Hanssons.

The project itself, led by Pape Thiem of the World Bank and Sunhilt Schumacher of SWAC is an interesting one seeking to identify interventions on different scales from minor to major that might be required in West Africa to allow investment in shrimp farming. Since the project is still ongoing I will not say more about it here except that I was involved as part of a team of consultants led by Stirling graduate John Dallimore of TNC Partners (MSc 1992-93) and while I was the "shrimp farming technical expert" Mike Phillips (Stirling staff 1982 -1991) of

NACA was collaborating closely in his role as "environment – sustainable development in agriculture/aquaculture expert" along with two other International consultants Pierre Faillier and Dato J. Jegathesan to take on respectively the role of "sociocultural expert" and "investment promotion in Africa expert". So it was something of an old "boys" reunion!

The farm is sited on a 250ha site on a small tributary of the Gambia river. The site was first developed by ScanGambia in the late 1980s. It had been abandoned since 1990 so there has had to be extensive renovation. This in some ways has been a handicap in that the farm was established to an Ecuadorean design with large 4ha ponds and relying on pumped intake water which suited the Ecuadorean system with its cheap (then) power but is less suited to The Gambia where electricity is either unavailable or hugely expensive. The farm depends on a total of 12 large generators but the diesel for these can also be scarce.

Many of the staff I met at the ponds were previously employed by ScanGambia and were clearly delighted the farm had been re-established. None of them had had any intervening employment – they had just returned to their fishing activities. Currently 50 people were employed on the farm, 15 people at the hatchery and the processing provides employment for a team of women over the harvest period. The farm manager is from Andhra Pradesh, Mr Rao, so it was encouraging to find that a little South-South cooperation was already in place when that was the long term objective of the project as a whole!

At the present time 15 ponds are being operated. My first visit confirmed that it is *P. monodon* that is being cultured. This was one of my biggest questions since searches on the web had told me that *P. monodon* was being exported from many West African states but a telephone call to FAO had told me emphatically that *P. monodon* was not to be found in W Africa. (I have to sympathise: I had made the same mistake!) The ponds are stocked very low but are growing well. All the commercial feed has to be imported but it is the only farm I have visited where feeding takes place overnight which is certainly best practice in terms of the shrimp physiology.

At the farm site there is a food store, freezer stores (refrigerated containers) and a blast freezer (1.5 tonne). While I was there the final work for installing a 3 tonne blast freezer was underway led by a visiting consultant engineer from Holland who regularly visits for technical work and training programmes (e.g. for the processing plant all the stainless steel welding was carried out by local labour trained by Mr Bolt). Everything is set up for effective self sufficiency. The Hanssons have lived and worked in the Gambia for many years and are prepared to start from first principles.

The hatchery is at a separate site some 20 miles away, also set up on Ecuadorean design but was not operational while I was there. Since the growing season for shrimp is limited to March – November (which could be a great advantage in terms of disease risk minimisation) they have built solar heated water raceways to warm the water as much as possible to allow breeding as early in the season as possible.

A detailed Environmental Impact Assessment (EIA) had been carried out for the farm by external consultants as required by provisions of the National Environmental Agency (NEA). I met with the Director of this agency (Mr Momadou Sarr) and the environmental controls are well set out. The EIA for the farm was detailed and included an assessment of the villagers' reaction to the farm development. This EIA specified three recommendations:- the first two, local involvement of people and conservation of mangroves were clearly both in place. The 3rd recommendation was however that the farm should, in conjunction with the Fisheries Department, investigate the interaction of *P. monodon* with the local species *P. notialis*. This would be quite a task without research capabilities, but at the same time it raises a very important scientific question which needs addressing.

The farm hopes for steadily increasing harvests as more ponds get renovated and the hatchery operations improve. A major problem is training fishermen to bring in broodstock in a condition in which they can survive let alone breed successfully. West Africa Aquaculture are producing beautiful shrimp in low density conditions - effectively organic - but they have looked into organic certification and it is probably an extra step they don't need to take just now when, despite all the Government support for the project, it is still quite a difficult endeavour.

It could also be that raising *P. monodon* in West Africa is just not within the terms for organic production. It is after all not a native species. This also raises problems within the SWAC project since farming native species is the desirable aim. From various reports it would seem *P. monodon* is fairly well established, presumably introduced from the farming operations (in Guinea, Senegal, Ivory

Coast as well as the Gambia) of the late 1980s to mid 1990s. It can easily be recognised in the catches by its striking size and stripes. But other farm operations introduced *P. vannamei*. Is that also to be found there? Is it just that it is not so easily recognisable in fisheries catches if no one is looking for it? But the existence of *P. monodon* does raise a number of important questions. Is there a length of time where an introduced species ceases to be regarded as exotic? What impacts



A crocodile slides into the water in a pond yet to be renovated

is *P. monodon* having on native fisheries species? Is it in any way reasonable to expect aquaculture enterprises to turn away from the desirable "exotic" species and try to farm the native species? *P. monodon* has been struck by many problems where it is native and farmed. My view is that it represents a very valuable resource for West Africa and if any further farming developments take place they should very much follow the low intensity model established by WAA and produce large healthy shrimp that command high prices. Every effort must be made to safeguard this great advantage and any attempts to introduce higher intensity culture systems should be resisted. West Africa should unite to totally control any movement of live shrimp in or out. West Africa farmed shrimp could become the market leader with its large size and evident health.

Patrick Blow was an MSc student from 1990 to 1991 and subsequently worked with the water quality monitoring group (Billy Struthers, Fiona Gavine, John Edmonson) and STAQ for about a year before getting a job with Commonwealth Development Corporation (CDC), which was the main financier of Lake Harvest and which asked him to manage it. Since then there has been a management buy-out (2002), which has not left him much time for a family (yet).

Commercial success in Africa - Lake Harvest Aquaculture (Pvt) Ltd – Zimbabwe

Patrick Blow

Lake Harvest Aquaculture (Pvt) Ltd (Lake Harvest) was established in 1997 and is probably the largest fish farm in sub-Saharan Africa, possibly in all Africa, producing around 3,000t of whole fish per year. We grow *Oreochromis niloticus* tilapia in ponds (juveniles) and offshore net cages (grow-out to market size). We then process the fish in a state-of-the-art factory that meets Europe's rigorous veterinary standards. All this happens at Lake Kariba, in northern Zimbabwe, on the border with Zambia.

Our main markets are Europe and the southern Africa region. For Europe we fly fillets three times a week to Amsterdam from Harare and then distribute to more than 20 customers across the continent but mainly in northern Europe, where



there is traditional demand for freshwater fish. We target high-end supermarkets and restaurant chains as we are focused on the high quality segment of the market. Lake Harvest is probably the leading branded fresh tilapia product in Europe. Competitive pricing is critical in the European market to achieve volume sales, and higher price / higher quality products such as ours find it difficult to penetrate. Nevertheless, we have secured regular customers for our fresh tilapia fillets, and interest grows year on year. In the region, we sell to a wide range of frozen distributors, again concentrating on the higher quality end of the market. We have been happily surprised at how demand, at acceptable prices, has burgeoned for our frozen whole fish and fillets in Africa.

We rear fry using a batch method but we are currently switching to the Asian style of hapa rearing, egg collection and hatchery spawning. This appears to offer the industrial scale farmer better controls and higher production numbers. We use semi-intensive ponds to grow fry to 25g before they get transported to the offshore net

cages, which are plastic circles. We prefer a pond start for the fish because of the extra nutrients that fish may benefit from in a pond environment. This is especially important in Africa where complete pelletised feeds are not often available. Feed availability and quality problems in Zimbabwe over the past few years have set us back considerably because of the intensive nature of our offshore cage operations, where complete and extruded good quality pellets are a must in our experience.

It has always been our intention to diversify our operations and to expand regionally. To this end, we have diversified in Zimbabwe into crocodile and poultry production, which seem to us to be highly compatible with tilapia, and they help to spread our risk. We currently have around 20,000 crocodiles and are expanding this challenging and exciting business. Having searched Africa-wide for some years for a good location, we are also about to embark on the development of a new large scale tilapia fish farm in Uganda, for which we have high expectations.

Our management team has gained much experience of aquaculture in Africa over the past nine years, and we are beginning now to take on consulting jobs for other would-be fish farmers, fish processors and



marketers, as well as for the public sector. If we have learned anything at all, it is that aquaculture in Africa is not for the faint-hearted. Mistakes are expensive and we should learn from the experience of others if we are to build an industry here. There is massive untapped potential for aquaculture in Africa but focused practical research, a focus on private sector development and cooperation among the stakeholders are needed if that potential is to be realised in the medium term. The same approach has yielded huge benefits to the industry in Asia. We see no reason why it can not happen here.