

Organic Synergy

RAS From Norway

NORAS WATERTech AS
www.noras-wt.com

Examples of species we've designed RAS facilities for:



NORAS WATERTECH AS specializes in the design and installation of a Recirculating Aquaculture System (RAS) and water treatment management system. RAS technology is a popular, environment friendly and highly productive LAND BASED indoor fish farming system which is operated under automated controlled environment that ensures disease control and industrial scale production of Healthy Fish.

Noras fish farm is designed to be energy efficient where no mechanical pump is used for main RAS operation. This RAS uses a custom-made Noras vacuum degassing unit that is used in the degassing, protein skimming and as circulation pump. The combination of these three features results in much higher energy savings compared to other RAS suppliers. Oxygenation is also optimized with the use of our nanobubble generator where oxygen losses are reduced and to ensure oxygen is available for use by the fish. The company has also designed and produced its own products like honeycomb bio-media for the biofilter designs, underwater fish light with a unique light spectrum that is designed to reduce fish stress, reduce fish maturation and improve fish growth with 40 years of horticulture experience.

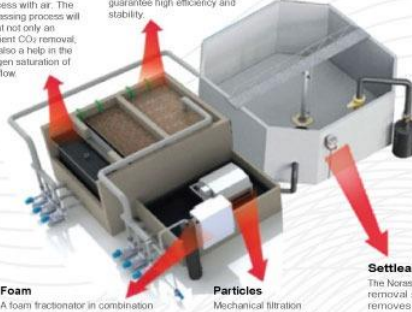
Noras has designed a highly intelligent unique system control software that assist in decision making on RAS Farm. All signals from feeders, oxygen sensors, water level switches, pumps etc are hooked on to a signal cable going to a PLC located in a control room. The PLC has software for data registration and trend analysis, ex SCADA system.



NORAS WATERTECH RAS

CO₂
CO₂ is removed through a stripping process with air. The degassing process will grant not only an efficient CO₂ removal, but also a help in the oxygen saturation of the flow.

NH₃
The MBBR technology performs the reduction of the ammonia nitrogen granting low operating costs and simple Maintenance. The process is designed to guarantee high efficiency and stability.



Foam
A foam fractionator in combination with ozone injection is able to remove the complex organic substances and all dissolved and suspended materials. The result of this process will be a more pure effluent with greater quality of color, turbidity and odor.

Particles
Mechanical filtration achieves the removal of particles larger than 60 microns, with a consequent beneficial effect for the MBBR performance.

Settleable solids
The Noras Trap solids removal system removes 95% of the settleable solids (uneaten feed and feces) in 3 to 5 minutes.

O₂
Through the oxygen saturators and the introduction of fresh Oxygen, the saturation of the water is guaranteed.



HONEYCOMB BIOMEDIA



VACUUM DEGASSING UNIT



FISH - TRAP



SUSPENDED SOLID REMOVAL



CO₂ STRIPPING



UNDER WATER LIGHT



UWL



NANO BUBBLE

PRODUCT INFORMATION & ANALYSIS

Species	Traditional Culture per Hectare	RAS Cultivation per Hectare
Shrimp	500 kg - 1000 kg	200 Ton - 250 Ton
Catfish	5 Ton - 10 Ton	1000 Ton - 2000 Ton
Whitefish	5 Ton - 10 Ton	1100 Ton - 1300 Ton

Species	Names of Fishes
Shrimp	Vanamme, Black Tiger (Bagda), Rosenbergi (Galda) etc
Catfish	Aar, Pabda, Gulsha, Ritha, Bele, Eel, Bacha, Boal etc
Whitefish	Barramundi (Koral), Seabass, Grouper, Indian Salmon, Hilsha, Zed Perch etc

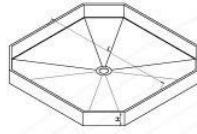
Species	Direct Production Cost Per Kg Larvae, Feed, Electricity, Salary	Sales Estimation Per Kg
Shrimp	\$3 - \$5 USD	\$8 - \$15 USD
Catfish	\$1.5 - \$2 USD	\$3 - \$6 USD
Whitefish	\$2 USD	\$5 - \$7 USD

Project Pay Back Period: 3 to 5 Years Depending On Fish Species, IRR: 18% - 30%



SOME BASIC ENGINEERING & DESIGNS

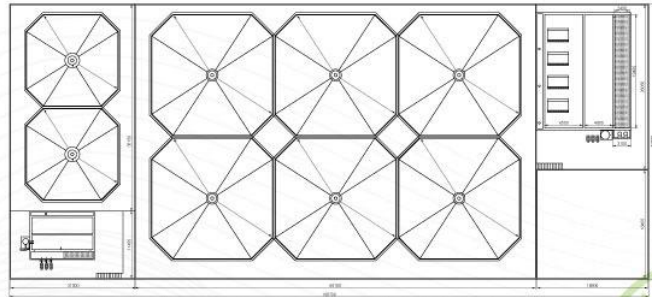
Each fish farm needs a **PREPROJECT** assessment for delivering successful detailed engineering, design and customization. It is very important to know the conditions of land, water and environmental factors to get project design in a synchronised manner.



LAND REQUIREMENTS

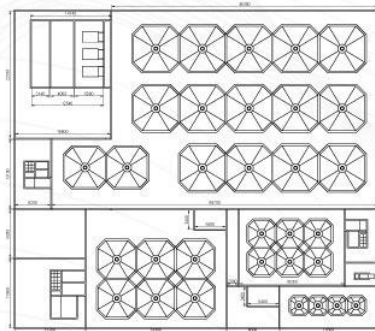
200 Ton Shrimp : 2 Acres
 1000 Ton Catfish : 3 Acres
 1000 Ton Whitefish : 3 Acres
 10000 Ton Whitefish : 20 Acres

Department	H [mm]	L [mm]
Grow-out	2100	20700
Nursery	2200	15700

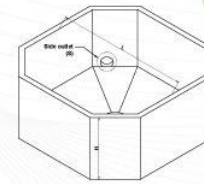


Layout of Shrimp / Catfish Farm

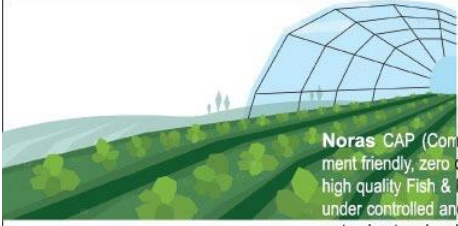
Month	Project Development Stages
Month 1	Land Development & Starting Construction Shed, Tanks etc
Month 2	Construction Work is in progress & Opening of LIC for Machinery
Month 3	Construction Work is in progress
Month 4	Construction Work is in progress
Month 5	Construction Work is in progress
Month 6	Construction Work is in progress & Arrival of Machinery in the Port
Month 7	Construction Work is in progress & Installation of Machinery
Month 8	Completion of Construction Work & Commissioning of Machinery
Month 9	Completion of unfinished Work & Releasing Larvae to the Tank



Layout of Whitefish Farm

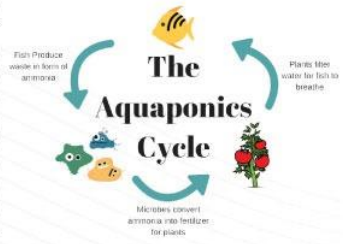


Department	H [mm]	L [mm]	S
Grow-out	3700	7800	Yes
Purging	3300	7000	No
Pre-ongrowing	3000	6500	No
Nursery	2300	4600	No
Quarantine	1800	3000	No



GREENHOUSE SOLUTIONS BY RAS

Noras CAP (Complemented Aquaponics) has a unique, environment friendly, zero discharge concept that involves the production of high quality Fish & Plants. These are grown within the same system under controlled and biosecure conditions. Fish farm waste (wastewater, heat and carbon dioxide) is collected, reconditioned for use in the greenhouse to achieve organic synergy. The concept creates an organic synergy that ensures optimum productivity of both fish and vegetable farms. For example, in a 1000 ton RAS fish farm, we can produce 7000 tons of vegetables by using the liquid nutrients coming out from the fish farm. This Liquid Nutrients could also be used in Aquaponics, Hydroponics, Rooftop gardening, Stadium's grass growing, Golf course maintenance etc.



DESIRED VEGETABLES & FRUITS

Watermelon, Rock Melon, Broccoli, Capsicum, Lettuce, Thai Leaves, Tiin, Strawberry, Butternut Squash



THE TEAM & EXPERTS



TROND VEGGER, MD



PER-MORTEN LYNGAS, CEO



BORGE SORAAS, Senior Advisor

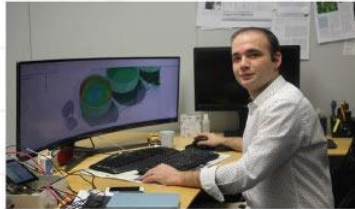
Lead Aquaculture Engineers At Noras Watertech



Jonas Ntiako



Preben Vegger



Okan Ozturk





Organic Synergy

NORAS WATERTech AS

Moreneveien 1, 3158 Andebu, Norway
www.noras-wt.com

Regional Office:



agile resources

today is tomorrow

www.agileresourcesbd.com
agilebangladesh@yahoo.com
Dhaka, Bangladesh.