

SØREN DAHLGAARD

GROWING VEGETABLES ON A CORAL ISLAND HIBALHIDHOO

2500 m² shadehouse arial view 2003,
Hibalhidooh, Maldives.



Inside view shadehouse, lettuce & cucumber.

Hibalhidooh, Maldives. 900 x 250 meters.
5°08'26 N 73°06'54 E.








SØREN DAHLGAARD

**GROWING VEGETABLES ON
A CORAL ISLAND
HIBALHIDHOO**

Installation view, Galleri Image.

-  HIGH VEGETATION WITH MATURE COCONUT PALMS
-  HIGH VEGETATION (VERY FEW PALMS)
-  LOW VEGETATION



LAND AREA (WITHIN HIGH TIDE LINE) = 103700 SQM (10.97ha)
 PERIMETER = 937M



HIBALDHOO
 June 2000 scale: 1:3500

SURVEYED: Adha	
SCALE: 1:3500	DATE: June 2000
DWG NO: DP	REV: 2 / 1
BINArch	
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Hibaldhoo was earmarked for agriculture development by the Ministry of Agriculture and is located 100 km North West of the capital Malé in Baa Atoll

THE MAD FARMER

Søren Dahlgaard

Jeg er fascineret af det potentiale, som nye teknologier repræsenterer – og af de nye teknologiers forhold til naturen.

Når man flyver hen over Danmark og kikker ud af vinduet, kan man se, at det danske landskab hovedsageligt består af firkantede marker. Altså ikke af rigtig natur. Der er praktisk talt INGEN vild natur tilbage i Danmark, kun marker, veje og byer. Hvis man introducerer GM – genmodificerede kornsorter, som giver et meget højere udbytte, kan man transformere halvdelen af Danmark tilbage til natur og stadig opnå det samme høstudbytte. Med GM kan man således skåne miljøet for en masse unødvendig sprøjtegift og kunstgødning, som løber forbi planternes rødder og ned i grundvandet.

Er det en kontroversiel tanke?

Forstil dig, at halvdelen af Danmark bliver omlagt til vild natur. Det ville være fantastisk. Det er noget, som nye teknologier kan muliggøre. Sagen er måske ikke helt så sort/hvid, som jeg ridser op her.

Det er imidlertid denne tankegang, som var med til at udvikle ideen om at producere fri-

ske grøntsager på en lille koralø i det Indiske Ocean. En idé, som kan synes urealistisk, men når man sætter sig ind i de moderne produktionsmetoder og teknologier, viser det sig, at ideen ikke er så langt ude alligevel.

Projektet blev udviklet og tilpasset et helt konkret problem.

Projektet byggede på ideen om at levere friske grøntsager til de maldiviske turisthoteller – som erstatning for den import af grøntsager, som hidtil havde forsynet hotellerne. For at gribe grøntsagsprojektet an på den bedst mulige måde talte jeg med så mange mennesker som overhovedet muligt. Jeg måtte jo forstå folk på Maldiverne, deres dagligdag, deres behov og hvordan tingene fungerer i en for mig helt fremmed kultur: En maldivisk provins atoll med små befolkningsgrupper fordelt på mange ganske små øer. Jeg var i konstant kontakt og udveksling med agronomer, lokalbefolkningen, landbrugministeriet, grøntsagsimportører og forhandlere, samt de få små landbrug, der fandtes. Også hotellernes indkøbschefer, kokke og gæster havde jeg kontakt til. Med denne tilgang, begyndte projektet langsomt at tage form og integrere lokalsamfundet. Brændstoffet i projektet var det, jeg lærte af folk, mens jeg var der.

Min svigerfar, Naseem, var af uvurderlig inspiration og hjælp i hele projektet. Hvordan agerer man? Hvordan etableres den nødvendige infrastruktur, så en øde ø bliver beboelig? Alt denne knowhow var fundamental for overhovedet at kunne påbegynde projektet.

Gartneriet og historien udstilles

Med to parallelle udstillinger i Århus beskriver jeg det omfattende projekt, jeg lavede sammen med et dusin ansatte på den lille øde maldiviske ø, Hibalhidhoo, fra 2002-04. Det lykkedes at identificere en række forskellige afgrøder, som kan dyrkes, og det lykkedes dernæst at producere et tilfredsstillende afkast under de svære forhold, som en lille koral ø uden rent grundvand og næringsholdig jord tilbyder. En ø, hvor både temperaturen og luftfugtigheden er væsentligt højere, end hvad der er optimalt for planterne. På udstillingen på Galleri Image (8.1. - 20.2. 2011) kan man se fotografiske installationer af projektet. Man træder op på en lille sandø og sætter sig til rette i lænestole og bladrer i fotoalbum med mange hundrede billeder fra grøntsagsprojektet.

I Århus Kunstbygning (22.1. - 3.4. 2011) fokuserer jeg på teknologien, forskningen og al den viden, der kræves, for at styre hele det produktionsapparat, som et gartneri er. Det var den lokale viden og den måde hvorpå teknologi blev tilpasset folks behov og situationen i Maldiverne, som gjorde det muligt at skabe et levedygtigt gartnerisystem, hvor vi tog hensyn til alle aspekterne fra produktion til salg. Hovedinstallationen består af et vandingssystem, gødningsblander, vækstlys og humlebier, der bestøver de godt 200 tomat-, chili- og agurkeplanter.

Den seneste teknologiske udvikling indenfor vækstlys i gartneri-industrien påviser, at planterne vokser bedre i en særlig rød/lilla lysfrekvens. Fremtidens gartneri bliver sandsynligvis med denne type vækstlys, hvor planterne kommer til at gro i etager i bygninger uden vinduer. Det vil nemlig være mere effektivt og rentabelt. Tre forskellige røde vækstlys-lamper er installeret med chiliplanter i et separat rum. Der ligger meget teknologi og forskning bag moderne gartneridrift – noget man ikke tænker over, når man køber sine daglige grøntsager.

Alt dette kan man studere i det faglige rum, hvor gartner-bøger, blade, rapporter, vækstresultater, importstatistik, research, kort, billeder og en dokumentations-video fra grøntsags projektet præsenteres.

I teksterne af Rasheed Araeen og Eliza Tan i dette katalog diskuteres projektet i kunst-sammenhæng. Jeg er jo billedkunstner, selvom jeg havde tropegartner-kasketten på i de to spændende år på Maldiverne.

God læselyst.

Søren Dahlgaard.

Import cost of vegetables

Unit cost + air freight cost x duty 15% on total + 20% for handling and local transport.

Waste is not included in the calculation since it varies a lot from item to item.

Example 1:

1kg of tomatoes from Sri Lanka costs		USD	\$	1.05
Air freight:	\$ 0.43	$1.05 + 0.43 =$	\$	1.48
Duty:	15%	$1.48 \times 1.15 =$	\$	1.70
Handling:	20%	$1.70 \times 1.20 =$	\$	2.04
Exchange rate	12.75	$12.75 \times 2.04 =$	MRf	26.01

Example 2:

1 kg of Lettuce Lollo Rosso from Dubai costs		USD	\$	4.43
Air freight	\$ 1.30	$4.43 + 1.30 =$	\$	5.73
Duty:	15%	$5.73 \times 1.15 =$	\$	6.59
Handling:	20%	$6.59 \times 1.20 =$	\$	7.90
Exchange rate	12.75	$12.75 \times 7.90 =$	MRf	100.8

Example 3:

1 kg of Lettuce Cos from Australia costs		USD	\$	1.76
Air freight:	\$ 2.18	$1.76 + 2.18 =$	\$	3.94
Duty:	15%	$3.94 \times 1.15 =$	\$	4.53
Handling:	20%	$4.53 \times 1.20 =$	\$	5.43
Exchange rate	12.75	$12.75 \times 5.43 =$	MRf	69.32

Air freight charges /kg.

From	Colombo	-	Male'		USD\$ 0.43/kg
From	Dubai	-	Male'		USD\$ 1.30/kg
From	Düsseldorf	-	Male'		USD\$ 0.99/kg
From	Frankfurt	-	Male'		USD\$ 1.51/kg
From	Australia	-	Male'	AUS\$ 3.48/kg =	USD\$ 2.18/kg

Ali Shafeeg agronomist consultant, Maarfahi, north Maldives



Hydroponics, Hanimaadhoo Government project, Maldives.



Fertilizer salesman, Sri Lanka.





Agronomist consultants, south of The Dead Sea, Israel 2003.



Aeroponics lettuce production, Singapore.



Tuan - tea plantation boss in tomato greenhouse, Sri Lanka.

THE MAD FARMER

Søren Dahlgaard

I am interested in the potentials of new technologies and their relationship to nature. As much as we have to be aware of how technologies can open up dangerous possibilities, as has been reiterated in our society, I am interested in the positive possibilities new technologies represent. If you fly over Denmark and look out the airplane window you realise the Danish landscape mainly consist of square fields. There is almost no wild nature in Denmark, just fields, roads and towns. If you introduce GM – Genetic Modified crops, which produce a much higher yield, we can transform half the land into nature and at the same time it is much better for the environment, since we can reduce the fertiliser and pesticides that go into the ground.

Is this a controversial thought?

Imagine half of Denmark converted into nature – it would be fantastic! This is something we can do with new technologies. This issue is of course not as black and white as I put it here.

With this line of thinking I developed the idea of producing fresh vegetables on a small coral island in the Indian Ocean. An idea which seems unrealistic at first thought, but

when you explore the modern production methods and technologies, it does not seem so mad after all.

The project was developed and adjusted to a specific problem.

The project was to produce and deliver fresh vegetables to the near by resorts and replace the imported vegetables, which until now had supplied them. To approach this vegetable farm project in the best possible way, I spoke with as many people possible to get an understanding of their needs, everyday life, and how things work. It was a very foreign culture to me – a Maldivian provincial Atoll, of small village populations on tiny scattered islands. I was in constant dialogue with agronomists, the local population, the Ministry of Agriculture, vegetable importers and traders, other vegetable farmers and resort managers, chefs and guests. Working with this method, the project slowly took shape and started integrating the local community. The fuel for the project was the knowledge I got from the people when I was there.

My father-in-law Naseem was a valuable inspiration and help throughout the project. How do you navigate? How do you establish the necessary infrastructure to make an uninhabited island liveable? All this knowhow is fundamental to be able to start such a project like this one.

Exhibition of the Greenhouse project

Making two parallel exhibitions in Aarhus, Denmark, I try to tell the story of this pilot project where I worked with 12 permanent staff on the small island of Hibalhidhoo in the Maldives from 2002-04. We managed to identify a number of crops, which can grow and produce a feasible yield under the conditions on a small coral island with no fresh ground water, no nutrient soil, and with high temperatures and relative humidity.

In the exhibition *Hibalhidhoo* at Galleri Image (8.1. - 20.2. 2011) photographic installations are displayed. You step onto small sand islands and sit in armchairs while you skip through photo albums with images from the vegetable project.

In the show *Growing Vegetables on a Coral Island* (22.1. - 3.4. 2011) at the Aarhus Art Building the main focus is on technology, research and all the knowledge that is needed to run the entire production system that a greenhouse represents. It was the knowledge

of the place and the way the technology fits with the people's needs and the situation in Maldives that actually allowed us to develop a viable agriculture system, which took into account all the steps from production to selling. The main installation consists of 200 tomato, chilli and cucumber plants, with an automatic drip-irrigation system, fertiliser mixer, grow lights and bumblebees for pollination.

The latest technology for grow lights in the greenhouse industry shows increased plant and fruit growth in the red/purple light spectrum. The future greenhouse will most likely use this kind of technology, where plants grow on shelves on top of each other in buildings without windows for daylight, since it will be more efficient and feasible. Three types of red grow lights are installed for chilli plants in a separate space. There is a lot of research and technology behind modern farming, which you might not be aware of when you buy your daily vegetables.

This, one can study in the office space, where hydroponics food production books and magazines are available, as well as reports, the growth and yield results from the Hibalhidhoo farm, research, statistics, maps, images and a video documenting the pilot project.

In the essays by Rasheed Araeen and Eliza Tan in this book the vegetable project is discussed in the context of art and the history of art, which is of relevance since I am after all a visual artist, even though I was wearing a farmer cap for two years in the Maldives.

Enjoy the story!

Søren Dahlgaard.

Soil analysis

רוויה %	P.H	E.C Ds/m	Cl meq/l	Ca+Mg meq/l	Na meq/l	N/NO ₃ p.p.m	(P(olsen p.p.m	K meq/l	Total Calcium
56.0	8.0	0.72	1.2	4.7	0.9	31.8	11.0	0.41	76.8

Soil texture analysis in percentage

Sand	Silt	Clay
90.3	2.8	6.9

Dear Soren

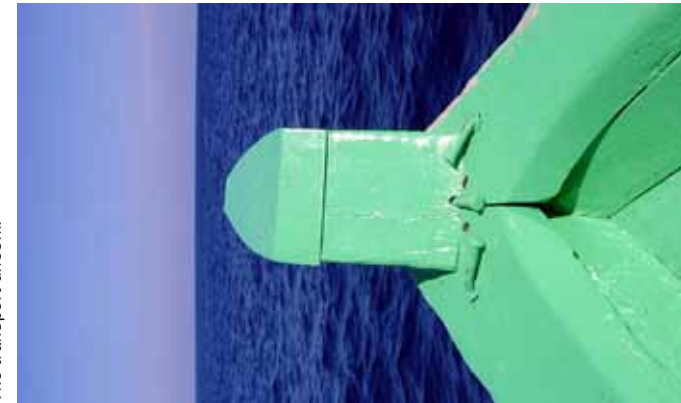
.In the table above you can see the soil analysis and the soil texture analysis Regarding the soil analysis results we can say that the soil is a medium soil that is because of some particles in the sandy soil. The P.H is slightly high and the E.C is low. The chloride is low such as the sodium. The level of the Phosphorus and potassium is low, mainly the phosphorus. If you remember I mentioned the phone call from the laboratory about the high value of the Calcium. The total calcium is very high but we don't know what is the part of the active calcium that influence more on the decision whether to grow on such soils or not. In such result it is reasonable to think that the active Calcium is high as well. Usually in sandy soils (near by seas) there is not clay at all but in this soil we have 7% of clay which the source of it is the .nature on the island. The source of the high calcium contain are the corals .About breeding a habanero pepper variety

In my opinion it will cost a lot of money around 100,000 \$. Second- I am sure they have not a habanero types. Third- let assume that the breeders can produce a good yielding hybrid variety but no one can assure you it will fit your conditions (temp. humidity exc.). The conclusion is to improve your local open variety, which does not cost you any money, by improving .growth methods

Yours Itzik



Hibaldhoo aerial view.



The transport dhoni.



Arriving to the island.



Hibalhidhoo beach.



Eskil & Amani on the beach 2003.



Jungle, Hibalhidhoo.

GREENFIELDS MALDIVES

HYDROPONIC FOOD PRODUCTION IN THE MALDIVES

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Company details

Name of the Entity:	Greenfields Maldives Pvt. Ltd. (Known as Greenfields).
Ownership:	Proprietary concern (Mrs. A. Amani Naseem and Mr. Soren Dahlgaard).
Nature of Business:	Agriculture – Hydroponics Food Production.
Location of farm:	Hibalhidhoo Island, Baa Atoll, Republic of Maldives.
Contact Person:	Mr. Soren Dahlgaard.
Contact Information:	Tel: +960 777326 Farm +960 785264 Soren mobile Fax: +960 799950 Farm +960 325499 Male' office E-mail: sorendahlgaard@aol.com Address: Sikkage Hulhangu Bai, Medhuziyaraiy Magu, H-Male', Rep. Of Maldives.

Description of Project

The idea of this project is to commence a large-scale commercial vegetable production, which will supply high quality vegetables directly to the tourist resorts and to the capital, Male'. With only a fraction of the vegetables produced in the Maldives of what can be produced, **Greenfields** sees a vastly unexplored potential in trying to fill this vacuum in the agriculture sector.

Background

The Maldives is a collection of about 1200 islands scattered in the Indian Ocean South West of India and West of Sri Lanka. The country, which is famous for its crystal clear water and white beaches, has 290,000 inhabitants.

Maldives is a nation of fishermen and with the sea being full of fish it is logic they have a large fish industry. Since the early 1970's where the first tourists came to Maldives, the tourist industry has grown rapidly and in 2003 there are 85 tourist resort islands operating and over 500.000 tourists has visited last year. The tourism growth is over 10% per year and is likely to continue with new markets opening up in China and Russia.

According to custom figures more than 14,000 tons of vegetables were imported to the Maldives in 2002, representing a value of approximately US\$ 15 million. Since the tourism industry in the country is booming, the demand for high quality food items especially day-to-day fresh vegetables is increasing and the foreign exchange outflow is also rising.

Some Maldivians have a small home garden but the local production far from satisfies the market demand. Therefore most food items have to be imported on large scale.

The main reason for the minimal local vegetable production is lack of knowledge and space. Maldives does not have a history of farming and therefore information and knowledge from the agriculture ministry and farming community is still quite limited.

The soil in the Maldives is very sandy and the concentration of organic matter is very low. It is therefore difficult to grow most vegetable plants in the soil.

In order to save the out flow of foreign exchange and to serve the tourism industry with fresh vegetables, there has to be an alternative to cultivate vegetables without soil.

Hydroponics Food Production

Soil-less growing methods like hydroponics have been used commercially since the 1960s in Northern America and Europe. This method of growing vegetables has proven to produce a much higher yield than soil based plants. Soil-less grown plants use less space, water and fertilizers, which is a huge environmental and financial advantage. Less maintenance is required when growing the plants in an insect proof greenhouse compared to soil based plants growing in the open field because less plant diseases and insects are present. This means reduced use of pesticides (if any at all), which results in healthier and higher quality vegetables.

Land in the Maldives is scarce (total land area is just over 300 km²) and soil quality is poor. Hydroponics Food Production is relatively new in the tropics but has already proven successful in many countries such as Thailand, Singapore and Malaysia.

Location of Farm

The farm is in Hibalhidhoo Island, Baa Atoll, which is located 100 km north west of the capital Male'.

Hibalhidhoo Island measures 17 hectare (36 acres). It is roughly 900 meters long and 250 meters wide. Maximum area for vegetable production granted will be 5-6 hectare.

The Maldivian government has earmarked Hibalhidhoo for agro-cultural development and therefore strongly supports this initiative.

The location selected for the project is convenient for most factors. First, there are five - soon six - hotel resorts in Baa Atoll. They make up a certain near market for **Greenfields**. Secondly, transport to Male' by boat is 6 - 8 hours or 2 - 3 hours by speed boat and just 30 minutes by seaplane, which is not far compared to other available islands.

The local population in Baa Atoll is approximately 10,000 and they are very pleased to now be able to buy a variety of fresh vegetables locally. There are in other words both a local and a tourist market close to Hibalhidhoo Island.

Infrastructure Facilities

Presently **Greenfields** has established and operate with the following infrastructure facilities:

- Two Staff Houses
- General Store
- Office
- Agro-store
- Powerhouse
- Desalination Plant House
- Water Tanks
- Welds, Wiring and Piping
- 2600 m2 shade house
- 1 boat and 1 small motorboat.

Market Survey & Marketing

Market

Since vegetables are essential for the day-to-day consumption in households and tourist resorts the demand for fresh vegetables is very high and there is a stable and confirmed market for the fresh products.

The market size depends on which crops can be produced profitably in the Maldives. During the test trails already conducted in Hibalhidhoo Island, **Greenfields** has identified suitable varieties of the following high value crops:

Bell pepper, cucumber, eggplant, chili, lettuce and herbs.

These crops represent an annual value of approximately US\$ 2,000,000 for the Maldivian market.

Currently many resort hotels import vegetables in refrigerated containers weekly by air from Australia, Singapore, Dubai and Germany. India and Sri Lanka also export vegetables to the Maldives in large quantities by sea and air but 30% - 40%

is reported to go waste before consumption due to long transportation time, poor packaging and handling from the latter mentioned countries.

The **Greenfields** products are being targeted directly to the tourist resorts. Fresh vegetables produced in Baa Atoll, are being delivered directly to the kitchen of the nearby resorts. This is of course a great advantage for the resorts compared to the present situation where most vegetables are imported, cleared from customs, handled and transported.

With the first sales in June 2003, we have now established a network of relationships with resort chefs, supply managers, hotel owners, super markets and wholesale agents. They are all realizing and appreciating the high quality and freshness of the vegetables and the convenience of not having to import from abroad.

Competition

There are currently a handful of agriculture projects in the Maldives mainly growing in the open field some with a small greenhouse hydroponics projects on the side. There are to my knowledge two private entities that have some success and one of them is now planning to expand from a 500-m² greenhouse to a total of 5.000 m² of greenhouse. This project is located in north Male' atoll. It is expected they will mainly produce for and sell to resorts owned by the same company.

Several other companies are planning to go into the agriculture business because the market demand is so obvious. A successful vegetable production is not easy. It requires an experienced hydroponics specialist and continuous commitment to achieve a successful business.

Anyhow, the market is large enough for several big farms, so **Greenfields** is not concerned about future competition.

There are also export possibilities to explore. During the winter months in Europe tropical fruits are in high demand and many airplanes return to Europe with empty storage from the Maldives.

Research & Development

In the Agriculture Industry it is necessary to continuously test new varieties of plants in order to improve the production and product. The entity expects to re-invest 2-3% of the profits in research and development.

Human Resources

A successful soil less agriculture enterprise will make a significant contribution to the country's development. This would bring a much-needed diversification to the local economy, which presently is dominated by tourism and fisheries.

Opportunities for good jobs beyond the present tourist zone could relieve some of the pressure of the present urban migration to Male', which is approaching the population limits this small island of 1.7 km² can sustain. Many Maldivians from the atolls would prefer to remain in their home island communities if adequate economic opportunities are available in the nearby islands.

Presently **Greenfields** employs 12 full time staff based on Hibalhidhoo Island. These include:

- The Manager
- Agronomist
- Greenhouse Workers
- Mechanic
- Electrician
- Book-keeper
- General Workers
- Cook
- Speed Boat Crew and Transfer Boat Crew

Greenfields operates a Male' office and when required the business will open a sales outlet employing sales personal.

Most staffs employed are Maldivians. Due to the present non-availability of Maldivian nationals for jobs such as greenhouse workers and hydroponics specialist it is necessary to employ foreigners. Maldivians are currently being trained in Hibalhidhoo for greenhouse work by the agronomist.

Conclusion

The hydroponics technology is not new and the results have proven to be far more feasible and environmental friendly compared to traditional soil based farming.

Greenfields will be the first to commence a large-scale Hydroponics food production in the Maldives but not the first to do it in a similar climate. We are therefore confident that the project will be successful given that an experienced consultant in hydroponics food production is engaged in the project.

The challenge is to achieve self-sufficiency in vegetables to a large extend in an environmental friendly way. This can only be done by minimizing area of production and maximizing yields. To do this insect proof greenhouses and high tech irrigation equipment is needed.

A BRIEF ANALYSES ABOUT THE CONDITIONS FOR AGRICULTURE IN THE MALDIVES

Ali Shafeeg

1. Maldives is situated about 400 km South of India on the equator. The tropical climate and poor soil quality limits the type of crop that can be grown. The natural plants such as coconut, guava, citrus, mango and banana are adapted to relatively high salinity, low nutrient and rain fed situation.
2. Soil is highly alkaline due to close vicinity to ocean seawater and limits availability of micronutrients such as iron, manganese, and boron though they are available in the soil. Phosphorous is high, nitrogen low and potash negligible amount present in soil makes certain fruits difficult to grow and in particular most vegetable plant. Nutrient deficiency and higher temperature require extra effort to grow vegetable plant though profitable in the badly needed market. Soil texture is sandy loam in nature hence water with nutrient gets drain-off to the water table below. This pollutes the ground water lens, which become unusable for every-day purpose.
3. Rainfall is widely distributed through-out year with 1500mm. Except in December to March other months of the year is wet, but water quickly drain to the water table six feet below. Excess water later travel directly to the sea, wasting otherwise could be stored in reservoir. As a result of limited water reserve the carrying capacity of the island is limited, hence high population cannot be sustain in the islands. Land area of the country is 298sq.km, with coastal line of 600 sq. km, with only 13% of the land arable for agriculture farming.

4. So, the only cheapest way to overcome soil problems is to make compost to improve soil texture, improve nutrient availability and water holding capacity. Local farmers use organic waste with limited readymade nitrogen fertilizer to improve the soil to grow limited number of vegetables and fruit plants.
5. Infection of plants by pest is not common due to micro environmental situation as the islands are small with presence of few species of plants. Controlling pest by use of biocontrol is relatively easy by introducing predator insects. Plants are vulnerable to pest due to poor performance of plant under low nutrient available from the soil.
6. The demand for vegetable is rising with the incoming of more tourists and a population with increasing awareness of the importance of eating fresh vegetables daily. The price of vegetable is high compared to the world in particular to neighboring countries. Check IFAD data. Intensive farming is feasible with protected environment.
7. The investment done in the island Hibalhidhoo is one of the first vegetable projects in the Maldives to undertake systematic testing of crops and plant varieties based on thorough research. The project needed the following things to be corrected to achieve better results.
 - a. Temperature control by shade net of 50% and not 80%.
 - b. Raising the shade net higher than 12ft. for more circulation of wind.
 - c. Permanent technical staff in the field of cultivation of vegetables and drip irrigation.
8. Advantages of intensive culture in hydroponic and drip irrigation system.
 - a. Unlimited market for vegetables with good price throughout the year in Maldives.
 - b. Almost all vegetables are imported; short-term vegetables can give better return and early recovery of investment.
 - c. High return in small space that is about three times under conventional field grown method.
 - d. Water required is about 90% less compared to conventional field crops.

- e. Pest and disease control is easy and safe, hence more environmentally friendly products.
- f. Less space needed with healthy growth and early maturity of plants.
- g. Higher yields.

9. Disadvantages of hydroponic and drip irrigation.

- a. High set up cost.
- b. Growers require skill and knowledge to maintain optimum production in commercial applications.
- c. Because each plant in a hydroponics system is sharing the exact same nutrient, diseases and pests can easily affect each plant.
- d. Plants react quicker to changes in the environment, however, if this change is for the worst, plants will quickly react to it; showing signs of deficiency or trouble. Hot weather and limited oxygenation may limit production, and can result in lost crops.

• Ali Shafeeg, Consultant in primary industries, fisheries and agriculture, in Maldives and consultant to the agriculture project in the island Hibalhidhoo 2002-04.

The Chilli market in the Maldives

Figures from 2002 and 2003

Imported fresh chillies 301.171* kg/year

Different chilli types not specified

The majority of these chillies are imported from India.

Market share of round chilli compared to long green chilli estimate:

Total import cost from India	Rf 25	/kg
Whole sale in Male'	Rf 30	/kg
Retail in Male'	Rf 35	/kg.

Locally produced chilli to market in Male'

Estimate 1.200 kg/week x 52 = 62.400 kg/year

Whole sale price very fluctuating Rf 20-150/kg

Realistic average minimum price Rf 30 /kg

Retail price in Male': Rf 1/chilli x 80 chillies = Rf 80 /kg

The retail market for the locally produced chilli 'Jamaican type' is lucrative at times but price is extremely fluctuating and market size is not very big.

Total fresh chilli market in Male' = 363.571 kg/year

363.571 x Rf 30/kg = 10.907.130 Rf/year

Number of plants and area of production required to meet this market:

In a shade house 1 plant produces 20 chillies/week. 2 plants/m².

363.571 kg chilli x 80 chilli/kg = 29.085.680 chillies/yr.

29.085.680/52 weeks = 559.340 /week

559.340 / 20 = 27.967 plants

27.967 / 2 plants per m² = 13.984 m²

In a greenhouse 1 plant produces 40 chillies/week. 2 plants/m².

Approximately 7000 m² of greenhouse will meet the total market requirements.



Clearing the jungle for the shadehouse.



Casting the office floor, Hibalhidhoo, 2002.



Antenna tower by the beach for faxing.

* = Statistics from Maldives customs 2002.



Shadehouse foundation block.



Beach sand for the shadehouse floor.



The finished shadehouse 50x50m.



Loading coconut trees to sell.



Casting blocks from the beach sand and senior staff house.



Sea water sedimentation tank before desalination.



Installation of 60m³ watertank.



Welding shadehouse by night during Eid fasting month 2002.



Trench for 1500 m. power lines in the island.

A PILOT AGRICULTURE PROJECT IN THE MALDIVES

Ahmed Naseem

Søren Dahlgaards pilot project in Drip Irrigation agriculture in Hibalhidhoo Island, Maldives was a major success in introducing new forms of technology to the agricultural industry in the country.

The outcome of this pilot project was welcomed by the Ministry of Fisheries and Agriculture and considered a viable alternative to the traditional method. In light of the success of the drip irrigation system the Ministry has conducted many workshops across the country and introduced this system in many island communities. Many farmers earn their livelihood by selling the produce using the drip irrigation system that gives them a fast turn around in their business. Although the product was somewhat more costly than imported or the locally produced vegetable, the quality compensated for the cost, being disease free and tasty. Today many private island owners have taken up production of vegetable partly based on the experiences from the pilot project in Hibalhidhoo initiated by Søren Dahlgaard.

I had the impportunity to be of help to Søren while he was conducting his test project. His organizational capacity and the dedication he put into the project was remarkable and I wish him success in all his future endeavors.

• Ahmed Naseem, Minister of state for foreign affairs, Rep. of Maldives. Naseem pioneered the tourist industry in the Maldives. He brought the very first tourist to the country in 1972 and built the first resort island the year after. He introduced the concept of luxury resorts to Maldives in the 1980s.

og passionsfrugter. I går plantede vi i øvrigt - mere for sjov - 5 vindrue-planter, som forhåbentlig vil give en masse røde vindruer.

Men er det hele ikke bare, fordi Søren har en svigerfar med en masse penge, som bærer det hele igennem? Nej, ideen til dette projekt er Sørens egen. Og en rundgang på øen giver bestemt ikke noget indtryk af mange penge: Generatorerne, som laver elektisk strøm, er nogle gamle udtjente sager. Båden, som udgør transporten til og fra øen, er en gammel plimsoller med en motor, som også kræver en kærlig mekanikerhånd. Vandtankene er brugte sager af fiber, som er blevet repareret. Søren og hans folk har selv med machetter og motorsav ryddet lysninger i junglen til planterne, til "shade-house" og til husene. Og husene, ja dem har de selv bygget! Af mursten, som de selv har lavet! Spørg selv Søren, hvordan. Men selvfølgelig har det kostet nogle penge, som Naseem har sat på højkant.

Den øde ø, som den startede med at være, er altså ikke så øde mere. Der er omkring 12 mand i arbejde på øen med Søren som daglig leder (boss). Og det ser ud til at gå fint for Søren - uden nogen form for management-uddannelse fra Handelshøjskolen eller fine (læs: dyre og teoretiske) kurser i virksomheds-ledelse. Faktisk er det noget af det, som imponerer mig mest: Sørens ledelsesstil. Han er bare sig selv og taler med folk og forklarer hvordan de skal vande, gøde og beskære planterne, som om han har studeret på Landbrughøjskolen i en årrække. "Hydroponic food production" hedder produktionsmetoden, som er en hel videnskab, Søren på egen hånd har sat sig ind i. Tilbage til personale-håndteringen: Jeg glemte at fortælle, at arbejderne er fra Bangladesh og fra Maldiverne og taler sprog, som er uforståelige for europæere. Stort set også for Søren, men det kører alligevel fint med tegn og fakter, og fordi nogle af folkene kan engelsk.

Den første dag blev jeg vist rundt på øen af en Søren, der fortalte engageret om planter, frø, den rigtige tilførsel af vand, gødning og lys, bestøvning af planterne, hyring af arbejdere, indkøb af "fuel" (olie), mad, frø og andre nødvendige forsyninger, m.m. Og jeg har oplevet, hvordan han sælger de høstede grøntsager til nabo-øerne, til hotel-resorterne og til butikker i hovedstaden Male'. Søren har opbygget et imponerende netværk. Han kender de mærkeligste mennesker på de mystiske steder (bl.a. "Tarzan", som han kalder en butiksejer på nabo-øen, "fordi han er så tarzan-agtig". Vi var i øvrigt til middag hos "Tarzan", som præsterede

en imponerende bøvs - en middag, som er en hel historie for sig selv).

Nå, tilbage til Sørens salg af grøntsager: Den pris, der skal sælges til, er selvsagt ikke uvæsentlig. Under mit ophold var Søren flere gange i voldsom telefonaktivitet med en masse mennesker, og pludselig - vupti! - vidste han, hvilken pris, han vil tilbyde sine grøntsager til. Så gnækker han fornøjet og et svedent smil breder sig på hans ansigt. Jo, Søren har handelstalant. Jeg har egentlig lyst til at sende mine HD-studerende fra Copenhagen Business School ned til Søren, så de i praksis kan lære om markedsanalyse, research på internettet, prisfastsættelse, marketing, produktion og salg. Samt hvordan man planlægger investeringer, foretager de bedste indkøb og gennemfører omkostningsberegninger og leder sine medarbejdere. Og så vil de opleve, hvad iværksætterånd er for noget.

Jeg fik af Søren forevist det automatiske vandings- og gødningsanlæg, anlægget som afsalter og renser brakvandet fra undergrunden, og jeg fik set og hørt på de støjende generatorer, som producerer elektrisk strøm. Søren har en for mig imponerende viden om, hvordan alle installationer fungerer. I kanten af junglen ved strandbredden på "bagsiden" af øen står en lille antenne, som gør telefon- og fax-kommunikation med omverdenen mulig. Dog er internetforbindelse ikke etableret til øen, fordi det er umanerligt kostbart både i anlægsudgift og i løbende drift. Så Søren kan kun sende emails og researche på internettet, når han er i Male'.

Bag "senior-staff-house", hvor vi bor, står en parabol, som henter TV-signaler ned fra himelen. Man kan se adskillige tv-kanaler på tv'et i spise- og opholdsrummet, f.eks. Fox-channel, Sky-channel, National Geographic Channel, Adventure-Channel og et par indiske tv-kanaler. På Sørens kontor, hvor jeg sidder og skriver dette brev, er der to skriveborde, arkivskab, reol, computer, fax og telefon og et køleskab med plantefrø i! Der har de det bedst, siger Søren. På kontorets vægge hænger oversigter og planer samt fotos af mange forskellige planer - samt også tegninger af Eskil og fotos af familien. Vi er ikke glemt! Kontoret er et populært opholdssted, fordi det er det eneste sted på øen, hvor der er air-condition. For mig virker det surrealistisk med al denne hightech herude på jungleøen i Det Indiske Ocean.

Men livet på paradiso-øen er langt fra problemfrit. Dels må Søren i lange perioder undvære Amani og lille Eskil, som er

i Male', dels dukker det ene problem efter det andet op i grøntsagsprojektet: Rotter trænger ind i shade-house om natten og spiser af grøntsager og frugter. Bitte-små insekter påfører planterne sygdomme. Det var bl.a. årsagen til, at Søren måtte stoppe den ellers meget lovende produktion af agurker. Den kraftige troperegn påfører planterne skader. Nettet over "shade-house" slipper for lidt sollys igennem, men for meget regnvand, osv.

For Søren er disse problemer, som kan løses. Han kender også svaret på de fleste problemer, men erkender samtidig, at tiden er inde til at kontakte specialister i grøntsagsproduktion under varme himmelstrøg. Så her i slutningen af november rejser han til Israel for at tale med specialister, og i bagagen har han en lang stribe spørgsmål.

Jeg kunne fortsætte længe endnu med at berette om livet på Hibalhidhoo, men nu er kokken klar med morgenmaden - og det er heldigvis en anden kok, end "Sorte-Per", som vi kalder forgænger. Kun en tåbe frygter ikke hans mad!

Jeg må lige fortælle om de "kravlende hænder" (krabber), som løber på de hvide strande, om de flyvende hunde (store flagermus) og om fiskehejrerne, som ser ud til at være præcis den samme slags som hjemme ved Bagsværd Sø. Og om havvandet, som er 28 grader varmt, klart og med flotte farver. Søren's ø er, som jeg forestiller mig Robinson Crusoes ø.

Søren kommer til Danmark den 22. december og bliver til den 9. januar. Så der bliver nok anledning til at høre hans egen beretning.

Mange hilsner fra en stolt og imponeret far



Planting the first seeds with the family.



The Sri Lankan agronomist Edwin & Søren in the plant nursery.



1500 bell pepper plants.



Habanero chillies.



The first cucumber is ready.



Cucumber harvest.

Father and grandfather Frank at
Hibalhidhoo Island, Maldives - in the Indian Ocean.
17. November 2003

Dear Family & Friends.

I've now been just over a week on Hibalhidhoo - Søren's Maldivian island in the Indian Ocean - for each day that passes, I become more and more impressed. My eyes are about to roll out of my head, and my ears are about to fall off. It is unique, what he is doing. If this project succeeds, it will be proof that anything is possible. Simply ANYTHING. If you just believe in yourself and in your project and if you are diligent and committed 100 percent. This is what Søren is doing.

Even if Søren had an agricultural education these achievements would remain impressive, but he has taken an art education in London. And what does it have to do with the cultivation of vegetables in the Maldives?

"Not a bit", I say.

"Yes, quite a lot", says Søren, adding: "It is actually in many ways the same as when I make one of my art projects!"

How this relates, Søren explains in a fairly convincing manner. You can ask him yourself when he comes home to Denmark for Christmas and New Year, when he turns 30. (2003).

So: A young Dane, who has no agricultural training, sets out to grow vegetables on a deserted island in the Maldives, where there is no good soil and no water!

And as you know plants surely needs both - especially when it's 30 degrees C (in the shade) and when the sun is 25 times as strong as that we and our plants are exposed to in Denmark. Yes: 25 times stronger! (More than 20 minutes in the sun without sun block on your skin and you will regret it).

Is there no soil? No, it's sandy soil where only palm trees and mysterious jungle plants can grow.

Is there no water? No fresh water, but lots of salt water in the Indian Ocean and brackish water in the ground.

But as Søren says: I solve problems!

How? - You might ask him, but the fact is that Søren already half a year ago sold the first vegetables they produced. I have now with my own eyes seen, in his 2,600 sqm. "shade house" how chillies, tomatoes of various kinds, yellow and red peppers and squash are grown. Outdoors lettuce, cabbage, eggplant, papaya, watermelon and zucchini are grown. Yesterday we planted - for fun - 5 grape plants that will hopefully provide a lot of red grapes.

But is it all not just possible because Søren has a father-in-law with a lot of money that carries it all through?

No, the idea for this project is his own. And a tour around the island certainly does not leave an impression of a lot of money: The generators, which make electric power, are old rusty worn out models. The boat, which is transportation to and from the island, is an old fishing boat with a small engine, which also requires the loving hand of a mechanic. The water tanks are second hand, which they repair with fibreglass. Søren and his employees have even with machetes and chainsaws made a clearing in the jungle for the shade-house and the houses. And houses, even those they have built! Of bricks, which they have casted from the beach sand!

Ask Søren how.

But of course this operation cost money, which Søren's father in law, has lent him.

The originally desert island, is not deserted anymore. There are about 12 men living and working on the island with Søren as manager (boss). And it seems to go fine for Søren - without any management training from Business school or posh (read: expensive and theoretical) courses in business management.

Actually it is one of the things that impress me the most: Søren's leadership style. He's just himself and talks to people and explains how they have to water, fertilize and prune the plants as if he has studied at the Agricultural College in a number of years. "Hydroponics food production" is the name of the production method, which is a whole science; Søren has studied on his own.

Back to staff handling: I forgot to tell that the workers are from Bangladesh, India, Sri Lanka and the Maldives and speak languages that are incomprehensible to Europeans. Virtually also for Søren, but it still works out somehow with the use of sign language and gestures, and because some of the people know a bit of English.

The first day I was shown around the island by Søren, who enthusiastically told about plants, seeds, the proper supply of water, fertilizer and light, pollination of plants, hiring of labourers, the purchase of "fuel" (diesel), food and other necessary supplies. And I've seen how he sells the harvested vegetables to neighbouring islands, the hotel resort and to shops in the capital Male.

Søren has built an impressive network. He knows the weirdest people in the most mysterious places (including "Tarzan," which he calls a shop owner on the neighbouring island, "because he is so Tarzan-like". We were invited for dinner at "Tarzans" place,

and he performed an impressive burp - sitting on top of the dinner table itself).

Well, back to Søren's vegetable sales: the selling price is obviously not unimportant. Several times during my two-week visit Søren was in hectic phone activity with a lot of people, and suddenly - poof! - He knew the right price of the vegetables of the day. Then a pleased and sweaty smile would evolve on his face.

Yes, Søren has trading talent.

I really want to send my Business students from Copenhagen Business School down to Søren, so in practice they can learn about market research, research on the Internet, pricing, marketing, production and sales. And how to plan investments, making the best purchase and implement cost calculations and lead a team. Then they will experience what entrepreneurship is.

Søren showed me the automatic watering and fertilizer system for the plants, the desalination plant, which purifies the salty water, and I saw and heard the noisy generators that produce electric power. Søren seems to have an impressive knowledge of how all the systems work. At the edge of the jungle on the shore at the "back" of the island is a small antenna installed, which makes telephone and fax communications with the outside world possible. However Internet connection is not established on the island, because it is very costly both in construction costs and running expenditure. So Søren can only send emails and research on the Internet when he is in the capital Malé.

Behind the senior-staff-house where we live, is a satellite dish installed. You can watch several channels on the TV in the dining and living room, for example. Fox Channel, Sky Channel, National Geographic Channel, Adventure Channel and a few Indian television channels.

In the office, where I am writing this letter there are; two desks, a filing cabinet, bookshelves, a computer, a fax and telephone and a refrigerator filled with tropical seeds from many different countries! "That is the best seed storage", says Søren. On the office wall hangs charts and plans, photographs of many different plans - and also drawings by Eskil and photos of the family. We are not forgotten!

The office is a popular place to hang out because it is the only place on the island where there is air conditioning.

For me it seems surreal with all this high tech out here on a jungle island in the Indian Ocean.

But life on the paradise island is far from problem free. Søren is away from Amani and little Eskil who is in Malé for long

periods of time. And one problem after another pops up in the vegetable project: Rats penetrate the shade-house at night and eat the vegetables. Tiny insects cause plant diseases. This in particular is why Søren had to stop an otherwise very promising production of cucumbers. The heavy tropical rain causes damage to the plants. The shade net of the shade-house lets in too little sunlight.

For Søren, these problems can be solved. He also knows the answers to most of the problems he faces, but still realizes that it is time to contact specialists in tropical vegetable production. So in late November 2003 he will travel to Israel to talk to specialists, and with him, he brings a long list of questions.

I could go on much longer to tell about life on Hibalhido, but now the chef is ready with our breakfast - and fortunately it's a different chef than the former cook from Bangladesh. Only a fool does not fear his food!

I must tell you about the "crawling hands" (crabs), which run on the white beaches and the flying foxes (fruit bats) and the grey heron, which seems to be exactly the same type we have in Denmark by Bagsværd Lake. And about the seawater, which is 28 C degrees, clear and beautiful colours. Søren's island is, as I imagine Robinson Crusoe's island.

Søren will visit Denmark from December 22nd to January 9th. So there is enough time to hear his version of the adventure.

Greetings from a proud and impressed dad.
Frank.



Chinese cabbage.



Fridge full of seeds for the test trials.



Cucumber harvest ready to go to market.



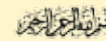
Søren & Eskil in the sea.



Captain & long squid.



Mohamed Fulu grilling redsnappers.



Growers of Orchids and Vegetables - Baa Atoll Hibalhidhoo - Maldives

Male', March 2004.

2003 report to Ministry of Agriculture, Male'.

From Greenfields Maldives vegetable project in Hibalhidhoo, Baa Atoll.

Greenfields Maldives is owned by Aishath Amani Naseem and managed by her husband Soren Dahlgard.

Construction and Infrastructure

(Existing structures)

Greenfields Maldives constructed and installed all infrastructure (including all underground wiring etc.) in Hibalhidhoo (except one staff house) starting August 2002 and completed in March 2003.

To initiate the pilot project a net house of 2.500 m2 were constructed. It was completed in August 2003.

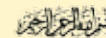
A drip-irrigation system was installed.
Plants grow in coco-peat in poly bags.

The net house structure only provides shade for the plants. Rain and insects penetrate the net.

Water

Ground water analyses: Conductivity 12.3 m/S.

Water for irrigation is currently produced from a desalination plant. This is very expensive and Greenfields Maldives is considering collecting rain water later this year.



Growers of Orchids and Vegetables - Baa Atoll Hibalhidhoo - Maldives

Crops tested in the net house:

Cucumber The first seeds were sown in April 2003. The first harvest was cucumber in June 2003. The quality of the fruit was very high. Failure in controlling disease on the cucumber plants lead to an early discontinuation of this crop.

Cherry tomato: Next crop to harvest was cherry tomato. Fruit was very sweet and of high quality. Fruit was also very small and the yield very low. We have not identified a suitable variety yet, which produces a satisfactory yield.

Lettuce: The lettuces were tasty but too lose due to high temperatures and insufficient radiation in the net house.

Tomato: Most of the trailed plants were healthy but could not set fruit due to high temperatures and low radiation. A suitable variety remains to be identified.

Chili: Grows well in this climate and fruit set was acceptable. Again Greenfields Maldives believe more radiation will improve the production. White flies, mites and trips are a constant thread to the plants but they can be controlled with the right plant protection methods.

Bell pepper: Several varieties were tested and plant growth was ok. Fruits were of high quality and very attractive. Again we could not control insects and the plants got too sick. Rats came into the net house to eat the ripe fruits, which also was a problem.

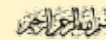
Leaf cabbage: Growth is ok; weight is on the low side. Leaf eating caterpillar must be controlled.

Chinese cabbage: High quality, rain damage, leaf eating caterpillar problem.

Conclusion from the net house:

The shade net gives 80% shade, which is too much, so the conclusions of all the tests until today are not very useful in those conditions. We now plan to change the shade net.

Greenfields Maldives brought expert consultants to Hibalhidhoo from abroad in March 2004, and they strongly believe it is possible and feasible to produce vegetables in the Maldives.



Green Fields
Maldives Pvt Ltd

Growers of Orchids and Vegetables - Baa Atoll Hibathidhoo - Maldives

Crops grown in local soil in open field conditions:

Eggplant
Water melon
Green chili
Pumpkin

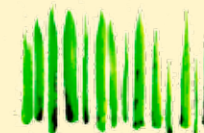
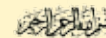
Conclusion of growing in open field with out irrigation system:

Since we were not able to control the common diseases, the trials were not so successful to this point. We are anyhow convinced that open field vegetable production can be done if the necessary know how is implemented.

General diseases: White fly, mites, trips, aphids and fungus. No viruses or bacteria problems were identified.

Harvest data for 2003:

Cucumber:	114	kg
Cherry tomato:	96	kg
Tomato/salad:	59	kg
Eggplant:	158	kg
Chili:	130	kg
Chili/green:	61	kg
Pumpkin:	156	kg
Sweet pepper:	40	kg
Water melon:	206	kg
Leaf cabbage:	49	kg
Leaf Chinese cabbage:	16	kg



Green Fields
Maldives Pvt Ltd

Growers of Orchids and Vegetables - Baa Atoll Hibalhidhoo - Maldives

Greenfields Maldives are planning to expand the production this year. We have now a fairly broad knowledge of the marked situation and with consultation from abroad as well as with the agriculture ministry's support structure we feel confident this project can succeed.

Before investing further in Hibalhidhoo, Greenfields Maldives must be sure that the current lease contract between Mr. Riluwan Shareef and the Government will be extended. This is a very large and long term investment so Greenfields Maldives wishes to secure its sub lease contract for the next 25-30 years. There are 16 years remaining of the lease contract now.

Best regards

Soren Dahlgard and Aishath Amani Naseem.

DISCUSSION: RASHEED ARAEEN & SØREN DAHLGAARD

The theme of 2011 in Aarhus Art building is based on the manifesto of *Ecoaesthetics* from 2009 by Rasheed Araeen.

Rasheed Araeen and Søren Dahlgaard discuss the agriculture project in relation to the manifest and art.

Rasheed Araeen:

There is now a widespread perception in the art world, particularly among those who consider themselves politically engaged and think they can change the world by merely representing its struggles. When they present the images of the struggling world, such as of the struggle in Gaza or the Palestinian land, in art museums, international art fairs or biennales, they think they are producing radical art. This is a delusion created and promoted by the liberal section of the art world, so as to prevent the imagination from penetrating the façade of its charity. As a result, what the so-called politically engaged artists produce is neither significant art nor radical politics.

Charity towards others is an essential part of human emotion and it can enhance one's concern for those who are in need of help. In the present state of the world, charity does an extremely useful work. I'm all for this charity. But when charity becomes an expression of the paternalism of the powerful, particularly in relation to those who continue to suffer from the legacies of colonialism, then there is a problem.

Although your work is also based on charity, it seems it has managed to avoid the

trap of the paternalism I have mentioned above. What I find interesting about your work is the process, which is continuous, and its continuity depends on the efforts and the productivity of the people themselves. You went to the Maldives and initiated an idea there, which was productive and it was then taken up by the people of the Maldives and expanded this idea through their own productivity. Once the people had taken up an idea and carried it forward through their own self-conscious productivity and efforts, it is no longer dependent on the charity that initiated the idea. This is indeed your achievement and I admire what you have done.

However, there remain many unresolved questions. What is art? You say: "it is not important to define the project as an art project or not – it is part of life". I disagree. I think we will have to define it. How? Maybe our exchange will answer this question.

Søren Dahlgaard:

I did the vegetable pilot project in the Maldives from 2002-04 I was not considering it to be a charity project, but perhaps I define charity differently from you? It was a business opportunity I wanted to explore, and a lot of good things came out of it.

The main long-term objective was to build a good business my family could make a living from (and it should be an exciting adventure as well). But first I had to test if it was at all possible to grow a number of different vegetables. To do this I had to undertake systematic testing of a large number of crops and crop varieties to identify which crops would work. I had to develop agriculture in the Maldives almost from zero. All the information and experience gained from these two and a half years of hard work and investment I have given to anyone who wants it. And it is being used in a number of agriculture projects around Maldives today.

Towards the end of the pilot project ADB – Asian Development Bank – wanted a group of experts to write a report titled: *Commercialization of Agriculture in the Maldives*. This report I had just done! So when I was asked to select the team of experts I was able to make use of my newly gained experience and knowledge.

The reason I am reluctant to call it an art project is because the intention and purpose of the project was not to exhibit it and place it in an art context.

This is why I was thinking of myself as a farmer and not an artist during those two years. I moved to a small Maldivian island with my Maldivian wife and child and settled there.

Now 7 years later I am exhibiting the project in an art institution and I want to keep the focus on telling the story and the difference the project has made for the agriculture sector in the Maldives.

I guess what I did also have to do with design. It is about organizing something as essential as fresh fruit and vegetables in a country with practically no land. The Maldives are 300 km² of land divided on 1200 tiny islands – sandbanks. 1000 islands are uninhabited and the islands stretch 800 km from North to South. The capital Malé is the most densely populated capital in the world. Just 2 square km² housing 150.000 people.

If you can expand your points about art that makes a difference, with reference to your manifesto it would be interesting.

Rasheed Araeen:

I admire what you did in the Maldives, and also appreciate the honesty with which you have presented your work. You did something, which was innovative and was as a result taken up by others and was made the basis of their own productivity. This is an achievement in itself and it doesn't need to be defined as art in order to be recognized as a socially important intervention. But the matter does not end there, because you are now showing this work in an art gallery as a response I suppose to a manifesto, which was about art. The gallery is in fact presenting your work as a work of art, even against your reluctance to call it art. How do you explain these different views, if not a contradiction?

I know I have raised a very difficult and complicated question, of which I myself do not have an absolute answer or resolution. However, the entry of your work, which was initially conceived and executed as a productive but consumable work or product, into an art gallery must deal with this question. The space of an art gallery must allow us to look at and debate what separates instrumental productivity from the cre-

ativity of art. In the manifesto of *Ecoaesthetics*, I propose to demolish the difference between instrumental productivity and artistic creativity. But this cannot happen within the prevailing order of things, because this difference is fundamental to the bourgeois capitalist society. However, I am not suggesting that it would be possible to get rid of this society merely by an artistic activity and replace it with something radically different, in which the division between productivity of the masses and the artistic activity of socially elevated individuals does not exist. But a radical move can be made through art towards an elimination of this difference or division.

Your work can be a beginning of a continuous process eliminating the division between the productivity of your own work in the Maldives along with the work of the vegetable growers there and what you are presenting in an art gallery in Aarhus, but only when all this is involved together and collectively in questioning and confronting the hierarchy of prevailing things and moves towards what can not only become a unified work of productivity and creativity but also offer a model for reorganizing equitably the whole society.

Søren Dahlgaard:

I went about this project in a similar way as when I do my other art projects. First there is a research phase, where I speak with professionals in the specific field to find out about materials, techniques and knowledge. Then there is the pre-production, production and postproduction. Much like a film or theater production, or a small factory production line. This is how I work and therefore I think the agriculture project in the Maldives was similar to my art projects, but just much bigger and over a longer period of time.

By presenting this project in an art institution I want to tell the story of the project. It is a project, which can be of inspiration for people. You can do something, which might seem almost impossible. It can seem like a very adventurous tale, almost as if it is made up and did not happen. But all the evidence is there, pictures of the work and the process. You can even see the buildings on Google Earth as proof.

Art can tell stories and inspire and so can this project inside the art institution.

This project is also a statement as much as other art projects. I saw there was a

problem or challenge; the lack of fresh local vegetables in remote areas in the Maldives and it made sense to do something about it. Good business ideas often start like this and so does charity. But can art? I think so. Many art exhibitions are well meaning (theoretical) intentions from well-formulated proposals but the actual outcome is an art opening where the art crowd feels at home but the local community or non art people are either not there or feel alienated towards this strange thing called art. I want to break down the barriers between people and the art institution and make people feel welcome and at ease so they can enter the work. This is one of the reasons I often make use of humor, which serves as an icebreaker to engage in the work.

In this project I think the fundamental challenges about fresh food is something everybody can relate to.

I will make a concert for the plants called *Music for Vegetables* at the opening, where a classical violin quartet will play beautiful music for the vegetable plants. This is fun and might seem slightly ridiculous to some, but there is serious research proving that plants grow better when they hear music and people are around them.

The myth that talking to your plants, will make them happy, is well known. But there is actually something to it. After we built the residential house in the island of Hibalhidhoo and started living there, the nearby coconut trees quickly started to bear more, bigger and tastier coconuts! I told my father in law and he replied; yes off course! Everybody in Maldives knows this!

But how do you prove or even explain this fact? The coconut trees react to the humans being around them by producing nicer and bigger coconuts. They like the company of people!

Rasheed Araeen:

Thank you very much for explaining your project. However, you don't have to justify your work by merely presenting its physical evidence. It is more than just growing vegetables in the Maldives, as its achievement as art is very much located within a trajectory of art history. In its own right it is a great achievement, and I congratulate you for this extraordinarily courageous work. But when it is looked at as art and

within an art historical trajectory, it reveals a significance, which goes beyond what you have described.

When we started this conversation I did not know much about you and the full details of the work. I wasn't aware of the enormity and complexity of the work. I now know more about your work, also that you were a student at the Slade School of Art in London 1997-2002; and since you describe yourself as a conceptual artist you must have been aware of the Conceptual Art of late 1960s and early 70s. I wonder if this knowledge inspired you in doing what you did, and which way. And what made you go beyond what was then achieved by Conceptual Art as recognized by art institutions? It seems your work does go beyond what has been recognized historically as Conceptual Art, and it should therefore be looked at in its historical trajectory. I will come to this later.

But first let me tell you about something, which you may not be aware. Of course, you wouldn't know about this because it is not part of art teaching in Britain or history of art taught anywhere in the world. I want to tell you this because the exhibition of your work now seems to be a response – as your gallery has announced – to my manifesto of *Ecoaesthetics*. Although this manifesto was first launched in London in 2008, its history goes back to the late 1960s when its initial concepts were formed. We are therefore fellow artists pursuing similar things.

There are also other things, perhaps mere incidentals, which seem to connect us. My first attempt to re-articulate the concepts of Land Art (in which I was involved in my own way in the late 1960s in London), the basis of Ecoaesthetics, took place at the end of 1990s. And its first concrete form, in which I put forward the idea of a farming village or community producing its own food as a Conceptual artwork, was presented in Karachi in December 2001. Its second presentation was delivered in the early 2002 at a conference within the premises of the Slade School of Art (when you were then an art student there). Its completed form was published as 'Towards a Concept of Nominalism' in *Third Text* in July-August 2002 (the time when you were completing your studies at the Slade).

These incidentals may not have any significance, and I am not trying to relate your

work with them. But they do reveal something significant: a freedom of the idea. As I have pointed out in my text (published as 'A Journey of the Idea') in my book *ART BEYOND ART*, an idea can move from one subject to another without they being aware of each other; it can also emerge simultaneously at different places at the same time. So, I am not surprised that when I was formulating the concept of a farming community growing its own food as a work of art, you were actually constructing it with its potential for a continuous growth.

What is more, you have put yourself within the work, thus collapsing the division of subject and object. They have become organically and dynamically one, something the institutionally recognized conceptualism of Land Art could not achieve – as it became trapped within the museum walls.

Let me now return to the historical trajectory of Land or Conceptual Art, to show how your work is a continuation of this trajectory but going beyond its art institutionally and historically recognized boundaries. There were many examples of conceptual works in which land transformation took place. But it was, I think, Robert Morris who first thought of a working farm as a conceptual artwork in 1968. There is however no document showing that he actually went ahead and produced the work. In 1982, almost fourteen years later, Joseph Beuys launched a project, at Documenta in Kassel, for the growing of 7000 trees, which he called a "social sculpture" for "regenerating the life of humankind". But it didn't do much for "humankind", as it was a symbolic gesture within the already established art historical framework of Land Art and became trapped in it.

What is therefore remarkable about your work is that while it is located historically within this framework, it breaks its art institutionally contained boundaries and enters into a life's process. However, although your work has entered the life of an organic process and given it something that is life enhancing, it is difficult to predict its further movement. Whether it is going to stay where it is today, going into cyclic movements and reproducing them in celebration of its achievement, or can move further beyond an achievement of its individual subject, is difficult to say.

Your work's achievement should however be recognized in its own terms, which is

enormous, without considering it as an outcome of the manifesto of *Ecoaesthetics*. Although the work has some elements of the manifesto, it has not yet moved to a point where it can be fully considered a manifestation of its fundamental concept of an egalitarian farming collective or community. It is difficult for me to say now whether you want to go further, so that the work becomes the work of a community rather than of an individual as being shown now in the gallery; nor I want to suggest that you should necessarily follow the path of the manifesto. The choice should be entirely yours, though we can discuss this when we meet.

There is something important which I want to take up. It is about the transformation – which is fundamental to your work – in relation to representation, particularly when representation becomes an object representing transformation outside its own context or space (a gallery or museum); which actually leads to a contradiction whose resolution is not found within the regime that demands the primacy of representation as the ultimate goal of art. However, I am not thinking only of your work but also about my own propositions that are part of *Ecoaesthetics* and other texts included my book mentioned before, with a question that cannot be resolved within the context of representation even when it is through representation that a transformation becomes a work of art. The solution to this seems to be a conciliation of the two through a transitory space between now and what the future holds in terms of their eventual disentanglement. However, it is not my intention here to drag you into this extremely difficult problem, which may not be necessary to invoke at this stage of your work. But a discussion of this problem may highlight what your work may face when it is appropriated and legitimized as a work of art merely by a representation.

• Rasheed Araeen (b. 1935 Pakistan) is a London based artist and founding editor of the art journal *Third Text*.



Boat maintenance.



Khateel & egg laying sea turtle.



Søren in the office.



Dharavandhoo staff going home after sowing the net for the shadehouse.



Eskil drawing with a coconut.



Satlfish 2 meter.

Kalaam.



Gayum.



Basenaik.





Israeli agro specialist, Itzik, measuring the sun energy, Hibalhidhoo.



Reinforced concrete block 1x1x0,4m was placed in the lagoon to anchor the ship.



Music for Vegetables concert during the opening at Aarhus Art Building 2011.

Valuation of Infrastructure on Hibalhidhoo island, Maldives.

This includes: Buildings, electrical wiring, piping and shade house for the plants

The island is developed by the company Greenfields Maldives for hydroponic vegetable production, which is a high tech and environment friendly growing method.

Following is a valuation of their building infrastructure. They are based on the information provided by Greenfields Maldives. The valuation method used is the cost of the facility incurred to its status.

The age of the infrastructure is less than one year. Therefore no depreciation of value.

Description of facility	Description of construction	Rate (US\$)	Total Unit	Unit	Cost (US\$)
1 Senior staff house: Living quarters for senior staff with 4 x bedrooms, 2 x toilets, large living room with open kitchen and food store room. Paint and finish. Varandah.	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow bricks with plastering and paint finish on both sides • floor - cement screed floor with ceramic tile finish • roof - corrugated GI sheet on angle iron • ceiling - gypsum board on timber frame • electrical and mechanical - full electrical wiring system with electrical fans and lighting. • plumbing and toilets - embedded waterpiping with fully tiled and fully finished toilets • septic tank 	42,00	1503	ft²	63.126,00

<p>2 <u>Staff bungalow:</u> Living quarters for junior staff includes 2 large dormitory style rooms and 2 bathrooms. Paint and finish. Varandah</p>	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow bricks with plastering and paint finish on both sides • floor - cement screed floor with linoleum sheets • roof - corrugated GI sheet on timber frame • ceiling - plywood ceiling with paint finish • electrical and mechanical - full electrical wiring system with electrical fans and lighting. • plumbing and toilets - embedded water piping with fully tiled and fully finished toilet • septic tank 	48,00	1545	ft ²	72.615,00
3 <u>Office Building</u>					
<p>- Office:</p>	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow block masonry wall with plaster finish upto 1 m height and the rest with GI corrugated sheets on GI pipe and timber frame, gypsum lining on interiors • floor - cement screed floor with ceramic tile finish • roof - corrugated GI sheet on GI pipe and timber frame • ceiling - gypsum board • electrical and mechanical - A/C and electrical wiring inside the wall 	36,00	220	ft ²	7.920,00

	<p>- <u>Tool room, fertilizer room, coco peat store and drip-irrigation control room:</u></p>	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow block masonry wall with plaster finish upto 1 m height and the rest with corrugated GI on GI pipe and timber frame. • floor - cement screed • roof - corrugated GI sheet on GI pipe and timber frame • electrical and mechanical - electrical wiring 	14,00	1140	ft²	15.960,00
4	<p><u>General Store:</u></p>	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow blocks masonry wall with plaster finish upto 1 m height and the rest with plywood on GI pipe and timber frame • floor - cement screed • roof - corrugated GI sheet on GI pipe and timber frame • electrical wiring and lighting 	14,00	370	ft²	5.180,00
5	<p><u>Power house:</u></p>	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow blocks masonry wall with plaster finish upto 1 m height and the rest with GI corrugated sheets on GI pipe • floor - reinforced concrete floor with cable trenches • roof - corrugated GI sheet on GI pipe • electrical and mechanical - full electrical wiring and lighting 	16,00	796	ft²	12.736,00

6	Desalination plant house:	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow blocks masonry wall with plaster finish upto 1 m height and the rest with GI corrugated sheets on GI pipe • floor - reinforced concrete floor • roof - corrugated GI sheet on GI pipe • electrical and mechanical - full electrical wiring and lighting 	14,00	358	ft²	5.012,00
7	Pump house	<ul style="list-style-type: none"> • foundation - mass concrete • walls - cement/sand hollow blocks masonry wall with plaster finish • floor - cement screed • roof - corrugated GI sheet on timber frame 	14,00	30	ft²	420,00
9	Wells and tanks:					
	- Shallow water weels					
	concrete wells 5Ø	cost + labour	2.500,00	1		2.500,00
	masonry wells 5Ø	cost + labour	2.000,00	4		8.000,00
	- Sea water tank + fittings	cost + labour		55	ft²	3.000,00
	- PVC tanks (2500L)	incl. valves and joints	500,00	10		5.000,00
	with cement base			10		
10	Electrical wiring:					
	- Underground electrical network for the island.		14,00	1500	m	21.000,00
	Phone lines and antenna		3,00	300	m	900,00
	- Distribution boxes		500,00	5		2.500,00
	- Street lights		100,00	5		500,00
11	Underground water piping:		5,00	700	m	3.500,00
12	Mobilazation for work					15.000,00
13	Clearing of land					10.000
15	Vessels:					
	Dhoni					20.000

Whaler				12.000
Out boat engine				5.000
16 Generaotrs:				
Danyo 20 KWA				20.000
Kirloskar 25 KWA				20.000
Mosa 12,5 KWA				14.500
Diesel standby				4.000
Petrol standby				3.000
Panel board, swicth etc.				6.000
17 Reverse osmosis system				
Desalination plant 1st time				13.500
Desalination plant 2nd t ime				9.000
Transport of materials	500	20		10.000
Estimated Total Value				391.869

THE NATURE OF SØREN DAHLGAARD'S HIBALHIDHOO

Eliza Tan

When advancing science and acceleratingly progressive technology alter man's long-standing relationships with the planet on which he lives, revolutionize his societies, and at the same time equip his rulers with new and immensely more powerful instruments of domination, what ought we to do? What can we do?

We have to get it into our collective heads that the basic problem now confronting us is ecological... It's high time we started thinking not merely in terms of politics and ideology but in terms of biology and the relationship of man to his environment.

Aldous Huxley, *The Politics of Ecology*, 1962

The increasingly conspicuous evidence of environmental degradation and the pressing need to create tangible solutions to ecological problems has since the 1960s informed the work of artists responding to the urgency of this situation, even as it continues to surface in awareness today. Within the wider premise of 60s and 70s Conceptual Art, ideas had emerged in various forms of Land Art, social sculptures and ecological protest actions. Richard Long's *A Line Made by Walking* (1967), for example, involved the artist pacing back and forth on grass, where he photographed the imprint he left thereafter as an attempt to create a 'sculpture by walking'. In Robert Smithson's *Asphalt Rundown* (1969), the artist released a load of asphalt from a dump truck, smearing the incline of a quarry in Rome as a comment on nature, art and human existence as interdependent spheres of activity. In yet another example, Joseph Beuys deforestation protest *Overcome Party Dictatorship Now* (1971) involved sweeping the forest floor and marking trees slated to be felled.

These actions underscored a reconnection between human life and the reality of natural ecologies, emphasizing a shift from art's location within the gallery to its conception

beyond the gallery's confines. Søren Dahlgaard's *Hibalhidhoo* (2001 - 2004) is likewise a present-day acknowledgement of the inseparability of art from its social and ecological registers. In this case, the uninhabited and little known island of Hibalhidhoo, formerly devoid of any existing relationships between man and this particular landscape, provided an unprimed canvas upon which to propose a new narrative.

Recall Aldous Huxley's *Island* (1962) and one might find that the utopian impulses underlying *Hibalhidoo* and many other eco-centred art works strike a chord with the tropes of science fiction. Desert islands are fecund metaphors for the living relationships that exist between man and his environment. An island connotes varying degrees of isolation and contact, distance and proximity, self-containment and interdependence; and with the presence of man or a society, competitive survival and cooperative choice. The concept of an island refers to clearly outlined yet porous boundaries, to existing limitations and to transformative possibilities. Find yourself marooned on the proverbial island and the fundamental task at hand would be to understand the island's ecologies and its existing social system - to acquire an awareness of the very limits of the land so as to potentiate its latent possibilities.

Activating this idea of an island as material and as metaphor, Dahlgaard's vegetable growing project brings to bear several questions. Given that the land, its biological and ecological make-up, forms a pre-existing narrative in and of itself, to what degree can this narrative be potentiated through human intervention and articulated in processes of art-making? To what extent is nature transformed according to man's civilising impulses? How does man come to see himself in relation to the land and to a society with whom he works with to inhabit and to own this land? Can feasible social model be cultivated towards the concurrent enhancement, rather than exploitation of our natural world and its resources?

The artist's intervention on the island of Hibalhidhoo saw to the development of a self-sustainable agricultural solution that addressed a biological and social problem specific to Maldivian island societies. The economic impact of a continued reliance on importing what could ideally be cultivated as local produce is nowhere more adversely felt than in underdeveloped regions with remote populations, the island economies of the Maldives being a case in point. Natural conditions inclement to the yielding of

fresh fruit and vegetables in the Maldives, such as brackish soil conditions, meant that thresholds to the land's productive capacity could be positively altered if irrigation and desalinisation systems could be introduced.

Seeking to address these concerns, Dahlgaard provided employment for 12 permanent staff and up to 55 Maldivian locals who were temporarily hired to reside on the island and develop its infrastructure, constructing a temporary vegetable-growing island 'state'. *Hibalhidhoo* saw to the realization of a cooperative social model based on collective initiative. The project contributed to the enhancement of the land's capacity for agricultural produce as well as to the community's self-sustenance and self-empowerment. A sense of ownership over the land and expansion of the community's productive agencies emerged in a process of working the land together.

While the project has since come to a standstill, with no current activity taking place on the island save for 1 or 2 individuals who continue to care for the existing infrastructure set in place by *Hibalhidhoo*, the work of art, as process and as gesture, continues to have an affirmative effect beyond the symbolic realm of art. However temporary the life of the project on the island, *Hibalhidhoo* importantly contributed to enhancing the texture of everyday life for Maldivian locals, for whom the span of this project opened up a space of transformative activity, possibility and new ways of enjoying everyday life on the island. New narratives, shared experiences and social bonds were created in the process, while the productive possibilities generated by the project continues to impact a wider physical and relational circumference.

Despite being unable to raise sufficient capital to see the project's expansion to commercial proportions, a major greenhouse facility is to be established in the Maldives by the Israeli agronomist consultancy initially hired by Dahlgaard. Greenhouse workers were conferred knowledge and experience to bring back to existing communities on neighbouring Maldivian islands, where some have since started growing their own vegetables. The artist remains hopeful that by cultivating vegetable produce, women from surrounding island communities, most of whom are involved in domestic work and occasional employment by the island's tourist resorts, may now be equipped to find additional avenues for self-employment and to generate family income.

In considering the nature of art and its relationship to social and ecological realities, Rasheed Araeen has raised a pertinent point. He elucidates that while early conceptual practices such as that of Beuys and Smithson proposed a shift in the historic conception of art beyond the gallery to that of a living process of relationships between man and the environment, such works were eventually re-absorbed into the parameters of the museum. Failing to become more than a symbolic gesture legitimised by the art historical frameworks of Land Art and the art institution, these became examples of work canonised as museum objects.¹ Dahlgard's island project responds to this concern.

Departing from the 19th century trope of a self-serving and internally directed 'art for art's sake', *Hibalhidhoo* evidently points to the enactment of art as a dematerialized process within a collective sphere of activity, rather than as an object. By introducing long-term agricultural solutions and the infrastructure required to realize these solutions, the project has evidently taken the notion of art as symbolic gesture beyond institutional parameters and into a social praxis in the form of a workable ecological model. The agricultural research, hothouse gardening techniques and irrigation systems set in place by Dahlgard's project has been made available for development by a wider community in a physical process that does not require any legitimisation by art historical frameworks which are otherwise irrelevant in this context. Several other tensions, however, pertain to the project. *Hibalhidhoo* is in another respect a 'large-scale installation' on the Maldivian island and moreover exists in the form of an exhibition within the hermetically-sealed space of the art institution. The inherent contradictions that arise with regard to the changing contexts in which the project is located raises questions as to what extent the artist's presentation of *Hibalhidhoo*, as it existed and still exists as a living, social sphere of activity on the island, does indeed escape reification. That is, if whatever is put out in an exhibition is already reified.

The exhibition in the Aarhus Art Building comprises the conversion of a ground floor room into a greenhouse for 300 tomato, cucumber and chilli plants pollinated by bees - complete with grow lamps and a drip-house irrigation system tended by an agricultural gardener. Different coloured lights on chilli plants demonstrate experimental pro-

cesses in another room. 3 intensive years of developmental documents, ranging from business plans and budgets, to scientific research and feasibility studies, photographs and hydroponic literature, occupy yet another room. Presented within the context of the art institution, *Hibalhidhoo* comes across as a retrospective document or relic of a performative gesture. In another instance, *Hibalhidhoo* at the Galleri Image takes the form of a browse-able compilation of images in a living-room setting in the gallery, complete with armchairs, coffee tables and sofas, concurrently a simulation of being on a small island of sand.

If the artist's intention here is to implicate audiences in questioning our own positions in relation to the objectification and consumption of art, it also makes evident his awareness of the nature and condition of art, the multiple contexts in which art comes to be located, disseminated to audiences and perpetuated within art historical discourse. One wonders if the *Hibalhidhoo* exhibition can in another light be perceived as an ephemeral research facility, an appropriated library or on-going laboratory that displaces the very function of the art gallery. Can it be considered non-commodifiable and therefore escape reification to a degree, in so far as no part of the exhibition can be acquired as an object or purchased as part of an institutional collection; non-transferable in so far as the project comprises the personal experiences of its collective participants, and non-replicable in so far its unique narrative is what forms the content of the project?

Further parallels should also be drawn between *Hibalhidhoo* and recent examples of contemporary art located within the expanded field of participation, relational and socially-engaged practices, so that a consideration of the nature and definition of the project as 'a site of active relations' may emerge alongside its opposite - its object, the 'exhibition', as its non-site. Underpinned by an artistic interest in collaboration, collectivity and direct engagement with particular social groups, Rirkrit Tiravanija's educational-ecological project *The Land Foundation* (1998-), located in proximity to the village of Sanpatong near Chiang Mai, provides one such example.

The Land project was initiated in anonymity and without a claim to ownership, where artists worked with the local rice farming community to cultivate the land and to develop agricultural techniques and amenities. The project was purposed towards meet-

1: Araeen, Rashid (2009), *Ecoaesthetics: A Manifesto for the Twenty-First Century*, Third Text, 23:5, 679 - 684.

ing various community needs, such as producing better harvests and higher yields, and caring for families in the village who had fallen ill from the AIDS epidemic. Artist-collaborators included, amongst others, Danish collective Superflex, who have been developing the idea of Supergas, a system that utilises biomass to produce gas, Tobias Rehberger, who designed a platform for the activation of biogas, alongside Thai artists Kamin Lerdchaiprasert and Prachya Phintong, who developed local infrastructural models such as a gardener's house and pools for fish-farming.

Like *The Land* project, *Hibalhidhoo* may be read as a project that exists in the form of organic zones of activity comprising provisional sites and non-sites. Its ever-changing topographies point to elements of the project as units that evolve over time and space, and which are made manifest in diverse forms. *Hibalhidhoo* was an active site located in and of the island itself some years ago while it is currently exhibited as a non-site, where the project must reflexively occupies the confines of the art institution. By comparison, Robert Smithson's conception of 'The Non-Site', which was essentially an indoor-earthwork, provided an effective metaphor for the undoing of boundaries defined by institutional parameters, an acknowledgement that art exists in a dialectical relationship with its institution, even if a work is realized beyond the gallery.

Just as Smithson's non-sites underscored the entropic quality of natural materials and energies, and the tendency of all structures to lose their former integrity, it would become apparent that a trip to a Non-Site in the gallery could be understood as 'invented, devised, artificial', as constructed as white-cube ideology and institutional fictions.² While such a gesture might have had no physical impact on a society in the way that Dahlgaard's project has achieved, the example nonetheless provides a relevant approach towards assessing the nature *Hibalhidhoo* as a process of social engagement and as an exhibition. In another instance, Richard Long, understood his indoor works as 'second-hand works' rendered because 'the art world is usually received indoors', acknowledging the presence of 'the art world' and gallery audiences as constituencies for whom art is made, even if on a non-exclusive basis.

2: Smithson, Robert (1996), "Unpublished Writings" in *Robert Smithson: The Collected Writings*, ed. Jack Flam, University of California Press, Berkeley, California.

Yves Klein, whose work dramatized the elemental forces of nature and its energies in relation to human sensibilities, presented *The Void* (1958) as a gesture that defined the gallery as an "empty" space of relations. Along a similar dimension, the transposition of *Hibalhidhoo* into this space could be seen as the enactment of a living 'void'. A dematerialised process of 'invisible' social relations defines the project and the objects comprising its exhibition reiterate the very absence of the project from the confines of the gallery, referring also to art's multiple 'users', which range from gallery-going audiences to the Maldivian individuals whom the project involved. That Dahlgaard's installation at the Aarhus Art Building comprises the conversion of the space into a greenhouse poetically comments on these tensions: art performs within and beyond the site of its initiation. It also performs outside the art institution as much as it is simultaneously cultivated within its civilising confines.

The intrinsic relationship between spheres of social interaction, spatial ecologies and institutional space has elsewhere been addressed within Dahlgaard's practice. *The Breathing Room* (2008) was a project that was realized in the context of the densely populated city of Singapore for the Singapore Biennale 2008, incidentally an island state that has embarked on expansive projects of coastal expansion and land reclamation. Comprising a construction made up of four white, inflatable walls, *The Breathing Room* was on the one hand a metaphor for the institution of the island-state, its natural and social ecologies, while it otherwise posed as a simulacrum of the white-cube. Visitors entering the space experienced its almost imperceptible expansion and contraction, where the space itself functioned not just as an architectural insert within the exhibition site but also as a living organism.

In a similar vein, *Hibalhidhoo* enacts the expansion of physical and social-relational space. It also gestures towards art as a moveable site - as contingent zones of activity which take on migratory forms that shape-shift across divergent contexts and spheres of reception dictated by different conditions of reception. Claire Bishop has lucidly pointed out that while the driving impulse of participatory practices is art's ameliorative function and the mitigating role of the creative imagination to de-alienate society from itself, 'the urgency of this political task has led to a situation in which socially collaborative practices are all perceived to be equally important artistic gesture of resistance: there can be no failed, unsuccessful, unresolved or boring works'. She goes on to

explain that addressing the 'contradictory pull between autonomy and social intervention and [to] reflect on this antinomy, both in the structure of the work and in the conditions of its reception' is the challenge which artists embarking on such projects face.³

While the ecological parameters of *Hibalhidhoo* remain the project's preponderance, inhabiting the space of the gallery has served to add depth to its premise, extending its breadth of perspectives on the porosity of social boundaries, institutional frameworks and ecological realities around which art must be purposed and re-purposed. These productive contradictions, which form the aesthetic drive of *Hibalhidhoo*, are precisely the elements that make the project interesting as art. It would be limiting to assess the nature and essence of *Hibalhidhoo* solely as a social process or as an object of an exhibition precisely because the project so successfully demonstrates that art, ecology and society exist in one and the same breathing space. As an open proposition, *Hibalhidhoo* conveys that it is within this space and this environment that self-sustainable ecological solutions must be introduced. The art of learning to inhabit the world differently would consequently not just be the stuff of dreams or of fiction, but a living, breathing reality.

• Eliza Tan is a London-based writer and independent curator.

Feasibility calculation for 2 hectare greenhouse production of chili and cucumber in Hibalhidhoo, Baa Atoll.

	USD\$
Greenhouses incl. irrigation equipment	900.000
Water tanks (6.000 m3 capacity)	100.000
Excavator (second hand)	10.000
Jetty	60.000
Transport vessel (second hand)	25.000
Generator 50 KWA (second hand)	8.000
<hr/>	
Total capital investment, stage 1:	1.103.000
<hr/>	
Annual revenue	600.000
Interest rate 6%	66.180
Loan repayment (8 years, first year grace period)	157.571
Running costs including: (Salaries, fertilizer, transport, fuel, food, communication, maintenance, transport, and island rent)	200.000
Depreciation of equipment/infrastructure (12 year average)	91.916
<hr/>	
Profit after first full year of production (14%)	84.333

3: Bishop, Claire (2006), *The Social Turn: Collaboration and its Discontents*, Art Forum, Feb. 2006.

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Exhibition Denmark:
Elo Aagaard drip-irrigation technician & Jens Jørgen Fisker Nielsen, Anderup El A/S; Henrik Jørgensen, Horticoop growth lights; Carsten, Explant Chili growers Fyn; JH Plant tomato & cucumber growers, Sjælland; Borregaard BioPlant ApS pollinating bumblebees; technician Hans Jørgen & co-curator Pernille Lyngsøe, Aarhus Art Building; Martin Røes, Carina Hellerup & Beate Cegielska, Galleri Image; Greenhouse caretaker in exhibition Niels Flade and Mana Naseem for the beautiful Maldives map for the exhibition.

Søren Dahlgaard
GROWING VEGETABLES ON A CORAL ISLAND
HIBALHIDHOO

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60 cucumber, 70 chili & 30 tomatplants. Automatic drip irrigation system,
fertilizer mixer, EC-, pH- & hydro meter. Growlights Agro 400W 12 pcs.
PPF (Photosynthetic Photon Flux) 660 mmol/sek. (yellow light spectrum).
Fans, pollinating bees, predeture mides has been released to eat trips in
the chili plants.

9 meter row of chili plants growing under: GreenPower LED production
module deep red/blue 45W.
Foreground: GreenPower LED overing lamp. Deep red/white 18W.





Ripe habanero chilies.



High temperatures in the Chinese cabbage.



Harvest going to market with mechanic Khaleel & bookkeeper Siraj.