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December 7 1984

Ambassador Mahmoud H Nur Somali Embassy 600 New Hampshire Avenue NW Washington DC 20037

Dear Ambassador Nur

My name is Gordon Sato, and I have been the Director of the W. Alton Jones Cell Science Center in Lake Placid, New York for the past eighteen months. Previous to that, I was a Professor of Biology at the University of California at San Diego for thirteen years. I include my curriculum vitae to give you a clearer idea of my career history.

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For the past four years, I have been developing food production on desert land near the ocean and this effort has recently culminated in a commercially successful enterprise that produces and sells brine shrimp. This facility currently produces one million lbs of brine shrimp/acre/year on desert wasteland on the Salton Sea. I believe that certain of the principles involved in the production of brine shrimp can be adapted to produce abundant quantities of food in your country.

The underlying principles are extremely simple. All food production ultimately comes from the energy of the sun which is converted by plants to material food. The deserts of the world have plenty of sun but few plants to utilize solar energy because of the scarcity of water. By utilizing seawater ponds the three elements of plants (algae), sunshine and water can be brought together on coastal deserts. From our experience such ponds can be expected to produce 100 tons dry weight of algae per/acre/year of which 50 tons would be nutritious protein. The fertilizers required would be inexpensive materials such as chicken manure. Human sewage and fish entrails could also be used.

The magnitude of this production rate is mind staggering. One acre of desert ponds can support 1000 people. This figure is arrived at in the following way: one acre produces 100 tons dry weight of algae per year or 200,000 lbs per year. Assuming for the moment that the algae is consumed directly by man, then a human being could be adequately nourished by ½ 1b of algae per day. This would be equivalent to 2½ lbs of meat because meat is about 10% protein and 90% water. Obviously, man can get by on less than 2½ lbs of meat per day, but this overestimate is used to take care of losses that occur further down the food chain. One person would then

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require 188 lbs of algae per year. 200,000 divided by 188 is approximately 1100 people per acre which we will round off to 1000 people/acre. Since we are unlikely to get people to eat algae, we can convert the algae to various fishes. Within the algal ponds we can introduce algae eating fish such as tilapia or filter feeders such as brine shrimp or barnacles. Although all three approaches are feasible and perhaps a combination of them could be used, I prefer to use barnacles.

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I propose to establish a hundred-acre facility on the Somalian coast which could provide sufficient food for a hundred-thousand people or a good market economy for 10,000 people. We would build a series of ponds near the coast extending for a mile along the coast. The ponds would start a few feet from the shore line and extend 300-400 yards back from the coast. The ponds will be dug to a depth of about one foot below the low tide line and connected to the sea by sluices with gates. In this way water can be let into the ponds at high tide and discharged into the sea at low tide. This allows us to avoid the expense and technical complications of using pumps. We expect to dig the ponds using a combination of explosives and hand labor. The rubble from the ponds will be used to construct reefs to enclose the ocean adjacent to the ponds. The enclosed area of the sea will be approximately twice that of the adjacent pond. The discharge water of the pond will be passed past a series of plates encrusted with barnacles. The plates could be made of inexpensive material such as chicken wire covered with a thin layer of cement. Barnacles would eat the algae and discharge barnacle larvae which would be eaten by fish. Barnacle larvae are free swimming animals without shells. Excess algae escaping the barnacles and unused fertilizer will insure that photosynthesis continues in the adjoining sea. For every acre of desert pond, an area of three acres will be using sunlight for the production of biomass. We expect to spend the first year digging the first series of ponds of varying size and to connect them to a reef enclosed area adjacent to the sea. The first year will be spent constructing ponds of a total area of 10 acres and an enclosed ocean space totalling 20 acres.

The purpose of building a series of small ponds first is to vary the rates of fertilizer input, schedule of filling and discharging water from the ponds, the rate of fish harvesting and methods of reef construction to achieve optimal results. The reefs surrounding the enclosed sea would also become encrusted with barnacles and kelp and would provide nesting cover for fish, and thus make an additional contribution to food production.

The second year would be spent enlarging the pond area to a hundred acres. This plan can provide self-sufficiency for the peoples of northeastern Africa at relatively little expense other than labor. One square mile of ponds can support one million people and once established the ponds and adjoining reefs become permanent installations requiring minimal maintenance.

The plan uses organisms (algae and barnacles) which are despised as nuisances because they are so difficult to eradicate. Because they are so hardy, they are ideal for our purposes.

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and what the wild to by the is the The W. Alton Jones Cell Science Center will assume responsibility for the funding of this project. The project is non-commercial and seeks only to help develop the capabilities of the local population. We seek the assistance of the Somali government in locating a site to work and advice on local customs and law.

I would appreciate it, if you could transmit this letter to your government and arrange for me an interview with your minister of fisheries government and arrange for me an interview with your minister of fis or agriculture.

Sincerely yours

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f. Si. I thank you for the recent opportunity to Lucius these plans with you in person.