Ark - PEI

Experimental P.E.I. "Ark" will do it all

Sun, wind, and water will all play a vital role in the operation of the 1975 version of the "Ark", which will be built on Prince Edward Island beginning this summer. The main difference between PE.I.'s Ark and its biblical namesake is that it is being built to utilize the elements, not as protection against them.

The 1975 Ark is an experimental, 2,500-square-foot unit with a greenhouse on one end and three fish-growing tanks on the other end, designed to be as self-sustaining as its biblical predecessor.

The $354,000 project is one of 14 that have received the approval of the Canadian Urban Demonstration Program (CUDP), it has been announced by Barney Danson, Minister of State for Urban Affairs, the federal Ministry responsible for the program.

The Ark is being designed and managed by the New Alchemy Institute (NAI). The Institute is a small organization of scientists and volunteers with a strong international character. Until now their primary base of operations has been a 12-acre farm on Cape Cod, Mass., but the focus will shift to P.E.I. with the initiation of the Ark project.

The Ark, according to an Urban Affairs Department press release, will be the most ambitious attempt in northern climates to combine under one household-sized roof the functions of generating energy, growing food, recycling wastes, and providing shelter. Major components are the 20-kilowatt, three-windmill power plant; three fish ponds (one of 1,800 gallons, two of 10,700 gallons) able to grow tasty summer fish crops in 10 weeks; and the 1,000-square-foot greenhouse that can produce tomatoes year-round, summer harvests of melons, beans and peppers, and winter yields of potatoes, pears, cucumbers and lettuce.

In addition to raising fish stocks, the three concrete tanks will provide the water that is pumped in to fertilize the two-foot-thick greenhouse beds, and to circulate through the soil to maintain plant root temperatures of 13 to 16 degrees Celsius. One half of the warmest tank will be closed off and covered with an insulating panel to store enough heat to warm the adjacent living area.

Supplementary heat will come from two wood-burning stoves, air blown from the greenhouse, and from an electric hot water tank powered by the three 30-foot-high windmills.

Overall design is based on a much smaller prototype Ark operated last summer on the Institute's Cape Cod farm. The roof above the pond and the greenhouse sloped southward at 60 degrees to capture as much sunlight as possible, reflecting panels mounted below the roof swung downward during the day to deflect sunlight to where it was most needed, and at night they swept upward to act as insulation. Solar heat maintained a fish pond temperature of 27 degrees Celsius.

The Prince Edward Island Ark is scheduled for completion next winter and will be subjected to continual tests of the steeply-pitched roof and wall solar panels, the windmills, the heat storage abilities of the fish ponds, the ability of rooftop vents to reduce humidity, and water filtration in the fish ponds. NAI scientists will also study, on a long-term basis, the microclimates in and around the building, the flow of energy, the yields of fish and produce, and the overall economic practicality of the Ark.

NAI president, Dr. John Todd (formerly of Hamilton, Ontario), who is also director of NAI's education and research centre in P.E.I., hopes the Ark idea will act as a catalyst, opening the way to a greater selection of cheaper home-grown fruits and vegetables and to widespread use of windmills to provide electric power. He stresses the potential of structures like the Ark to provide urban dwellers with a measure of the self-sufficiency that has traditionally been limited to the rural farmer.