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Ministry of Agriculture & Land Reclamation
US Agency For Intl. Development
Agriculture Policy Reform Program
Reform Design and Implementation

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الوكالة الأمريكية للتنمية الدولية
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Ministry of Agriculture and Land Reclamation

AGRICULTURE POLICY REFORM PROGRAM

Reform Design and Implementation Unit (RDI)

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APRP

Reform Design and Implementation Unit

Development Alternatives Inc. Group: Office for Studies & Finance, National Consulting Firm Development Associates, Cargill Technical Services, The Services Group, Training Resources Group, Purdue Universities, University of Maryland

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Report No. 114

ECONOMIC POTENTIAL OF LAND DEDICATED TO WASTE WATER IRRIGATION WITHIN THE GREEN-BELT OF SADAT CITY

Prepared by:
Dr. Kenneth Swanberg
Prof. Aida Allam

May 2000

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EXECUTIVE OVERVIEW

Egypt is no different than any other country; its waste water must be treated before it can be returned to the potable water system or before it can be used to irrigate food crops. This is a difficult task in Egypt because of the unique Nile River water system, which recycles water several times as it moves downstream, using the water over and over again for food crop irrigation, human consumption and industrial uses. If the water is contaminated it is unsuitable for this system. At present, water consumed in village, urban and industrial complexes is treated in Stage I and Stage II treatment facilities. But a Stage III treatment process is required before the water is suitable for reuse. A Stage III system in Egypt has been determined to be simply passing the water through the ground that has an agricultural cover crop, the roots of which act as the ultimate filter and cleanser. Since food crops can not be used for this process, non-food crops such as wood trees, ornamentals, mulberry, cut flowers and Jatropha Curcas (an industrial oil castor variety) have been designated for this use.

This paper has been written in response to a request by the Sadat City Growers to identify possible crops and crop combinations that could be grown using Sadat City waste water on land set aside for this purpose. Investigations into the potential productivity of trees grown for timber, pulp and chipboard, as well as decorative ornamentals and possibly flowers, and mulberry for silk worm production, have shown that a particular problem arises when investors (or farmers) consider tree crop production as their income base. Establishing tree lots under elaborate irrigation systems is costly, reaching approximately LE 5,000 ($1,500) per feddan (without land costs). Most trees take several years to mature before they can be harvested profitably. However, investors are generally reluctant to tie up their investment money for such long periods of time without realizing any periodic returns. As a result of this situation, there have been few if any investors or farmers who have indicated an interest in growing these crops using waste water, even though the land and the water have been offered freely by the State or Municipality for these purposes.

To cope with the delay in returns for tree crops, some countries such as India and Costa Rica, have embarked upon the issuance of "tree bonds" at the time of planting of the tree crops. "Tree bonds" vary from $2.00 to $20.00 each, and are attached to individual trees in a tree lot or plantation. The Bondholder buys the future value (the value of the harvested wood) of each assigned tree. Needless to say, return rates to the bonds must be significantly higher than local corporate bonds, if they are going to attract the local public into purchasing them, especially for such a novel and risky endeavor such as growing exotic trees. The Investor (farmer or tree lot manager) must realize even higher return rates than the Bondholder's rates. Although return rates for tree production are often quite high, partial returns must be more frequent than the 15 to 20 years that it takes for many tropical hardwoods to mature. This means that the cropping patterns must include several crop species in association with the slower growing trees in order to make the investments attractive. Several tree crop packages have been designed to satisfy these conditions, and they are described and presented in this paper. Growing trees using waste water is economically feasible and satisfies the above criteria. Now the task at hand is to design and implement a "tree bond" program to encourage investors to plant tree lots for use of waste water as a Stage III treatment facility.

ACKNOWLEDGMENTS

The Sadat City Agriculture Investor's Association, represented by their President and Vice President, Mohamed Salah and Ahmed Ekabal, invited APRP to assist them in identifying what trees could be profitably grown using waste water irrigation in Sadat City. Since Prof. Dr. Aida Allam had worked extensively in developing the ornamental greenery in and around the City and had developed the waste water trials for casuarina, neem, eucalyptus, cypress and zanzalekh, she was recruited to work on the study. Dr. Mamdouh Riad's Undersecretariat for Afforestation, introduced APRP to the "waster water" trials in Sadat City, and it was originally due to his creativity in initiating these trials and his enthusiasm for the tree program that led to APRP's involvement.

From the private sector side, we have been fortunate to have had the participation of chipboard processors and pulp paper processors as well as several financial management firms.

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I. Introduction

The Sadat City Farmer's Business Association, comprised of the farmers located in the green-belt surrounding Sadat City, approached the Agriculture Policy Reform Program (APRP) to request assistance in designing financially viable production plans for the area designated by the City's administration for irrigation using the city's waste water. This presented a rather unique challenge for the investment unit of the APRP because of the restrictions in crops that are allowed for production using waste water.[1] Because of these limitations, the crops considered in this study are limited to the fast growing tree crops – casuarina, zanzalekh, eucalyptus, neem and cypress, and poplar; the slower growing mahogany hardwood *khaya senagalensis;* mulberry production for silkworms; and the ornamentals ficus and decorative palm.

Production data was obtained from the test site at Sadat City that has used waste water for irrigation over the past several years and from similar test plots with waste water located at equivalent lattitudes in Ismailia and elsewhere, as well as from other test sites using fresh water. The data for mahogany was obtained from the plantation site at Luxor which uses waste water. Additional data on tree growth rates was obtained from the Undersecretariat for Afforestaion of the Ministry of Agriculture and Land Reclamation (MALR).

Tree production creates a dilemma for investors. A significant amount of money is needed to establish the tree plantations (henceforth referred to as "tree lots") and income from the sale of tree products often takes several years to materialize. This is also true for fruit and nut trees, which often do not bear fruit until the fifth to the seventh year. Timber hardwood trees generally take fifteen to thirty years to grow before they are large enough to be harvested for making veneers or cut into planks large enough and of sufficient maturity that they can be made into quality furniture. But some trees grow fast enough such that in five years they can be harvested for pulp for making paper, for chips to make MDF (medium density fiber board), or for small strips which can be used for parquet flooring or moldings.

However, most investors and virtually all farmers, are usually not willing to wait this long for returns on their investments, in spite of the expectation that those returns might be quite high and significantly greater than normal return rates in agriculture. To cope with this situation, "tree bonds" have been introduced in some countries, such as India and Costa Rica. "Tree bonds" are unique in the investment world. A "tree bond" is issued when an investor (the one who establishes the tree lots, henceforth known as the Investor) sells the future value of the trees

[1] Food crops are generally prohibited because of the fear of the ingestion of the heavy metals that can be absorbed by these crops when grown with waste water. Although this fear may be exaggerated, it has reached the media and no one is prepared to try growing food crops with waste water in Egypt at this time. Nevertheless, we have tested some crops using waste water and compared their level of heavy metals with the accepted standard in Egypt and found them to be within the normal range.

at the time of planting to individuals (known as Bondholders). The Bondholders must be willing to wait for the future sale of the trees before they collect a return on their investment. Since the individual buyer of the tree bonds – the Bondholder - only spends a minimal amount of money for the bond in exchange for the expectation of a large return in several years, many such Bondholders generally surface when the bonds are made available to the public. Each tree bond might have a price of between Le 20 to Le 100, and an annual return rate of over 30%. Although this is a relatively small amount of money for each tree, when multiplied times the number of trees planted per feddan, the total amount of money collected for an Investor who has several feddans is significant. And in fact, because of the number of trees per feddan, the money collected is sufficient to cover the establishment and maintenance costs for the tree lot until the first fruits or cuttings of the trees are harvested. If the tree lot Investor plants an extra tree for each tree that is sold as a tree bond, then the Investor will earn a significant future return without having made any initial investment. Return rates to the Investor will be extremely high, higher than any instrument in the capital market at the moment. In fact, if the up front money collected for the sale of the tree bonds covers all investment costs, then it is not possible to calculate an IRR (internal rate of return), because no equity has been invested.

What remains is to determe how to set up the tree bond program, how to obtain authorization to operate a tree bond program and how to avoid the moral hazard associated with any long term investment, i.e. will everyone involved honor their financial contractual commitments? Will they (the Investors) make the specified payments when they are due and for the correct amounts to the right individuals (the designated Bondholders who purchased the bonds originally)?

This study will show how to structure such a program and give the economic data that can be expected from growing trees, ornamentals, and other crops using waste water for irrigation. The information from this study will provide the technical documentation that will be required to set up the bonds and to obtain legal sanctions for such a program.

II. Waste Water for Irrigation

A Stage I waste water treatment process removes sludge and other solids through chemical and physical treatment in an enclosed facility. **Stage II** places the waste water in open ponds with chemicals for aeration treatment to further remove toxic material. **Stage III** is designed to place the water in open agricultural fields in which a crop is cultivated. After passing through these three treatments the water will be safe to return to the Nile river system or the underground water table.

Water exiting Stage II treatment facilities is not safe for consumption, and hence, it cannot be used to cultivate food crops. Although cotton is not a food crop, cotton seeds can be used for vegetable oil and cattle feed, and so cotton may not be permissible or may be grown only for fiber production. (This may require special control and treatment because of the fear that cotton seeds could be used for vegetable oil or animal feed.) Virtually the only crops that have been tested and meet all the criteria for Stage III treatment in Egypt are timber trees, mulberry (for silk worms), ornamentals and *jatropha curcas* (a castor oil that is a diesel and kerosene oil substitute with no black carbon smoke.). The question then becomes whether these crops are feasible from a production perspective and economically viable from an investment perspective.

The MALR Timber Trees Research Unit of the Undersecretariat for Afforestation has been testing mahogany (*khaya seneglensiis*) using waste water for the last five years in several sites. The reason for using trees in the fields designated for dumping waste water has been referred to above, namely that the crops must be non-food crops. Because of the rich nutrients in the waste water, growth rates of the trees appear to be faster than the norm found elsewhere in tropical climates for these hardwoods. Usually, foresters will maintain that mahogany requires over thirty years to mature to the point where it can be harvested for timber wood. But the waste water seems to enhance the growth rate for the mahogany to a rate where it apparently grows faster than one inch in diameter per year. At this rate it is projected that it will be over 40 centimeters in diameter by year fifteen and approximately 10 meters high. The same mahogany harvested at years ten and twenty in Luxor have been tested for their usability for cabinetry and they appear to be quite suitable. As a result the value of such trees is significant. One tree at 15 years, priced conservatively at just Le10 per board foot yields approximately Le3,500 at cutting time. However, because establishment and maintenance costs mount up during this gestation period, few investors would be willing to wait fifteen years without any returns.

II. Economic Returns

Selecting the Crop Several crops can be grown using waste water irrigation. As mentioned earlier, the principal crops that are targeted in this program are mahogany, either associated with poplar or some other faster growing tree, or grown in sole stands; the various fast growing trees casuarina, eucalyptus and cypress; the neem tree; mulberry for silkworm production; and ornamentals. Other crops are possible such as the castor oil *Jathropha Curcas* but production data is not available at this time for us to calculate its economic feasibility. The possibility of cut flowers requires a ruling from the authorities to permit them to be grown using waste water. Other crops do well under waste water irrigation but their production is prohibited

because they are food crops, such as cotton (because the cotton seeds are pressed into vegetable cooking oil) and vegetables.

Each of these tree crops that can be grown using waste water have different economic return rates. Their return rates vary according to the periodicity of returns, the size of the returns (based on the growth rates of the plants and the estimated market prices) and the density of the plantings. The amount of waste water available for this from of irrigation is more than what is needed for each crop and is only a limiting factor if too much water is applied to the crops. Based on this information each Investor must select his or her own preferred choice.

Bond Prices and Returns The choice of the price of the bond for each tree or each crop is critical, and depends on how high the internal rate of return has to be to ensure that the public will buy the bonds rapidly. If the internal rates of return on corporate bonds in the local capital market are only 11%, than anything a few points above this rate should be in strong demand. However, it is predicted that the return rates for tree bonds will have to be significantly higher than the corporate rates because of the novelty of "tree bonds" in Egypt and the perceived riskiness of such investments, especially with regard to the moral hazard. To overcome these constraints, it is felt that internal return rates will have to be over 30% for the Bondholders. Most venture capital companies expect to earn 25% on the capital they invest in Egypt, and the novelty and riskiness of "tree bonds" would require significantly higher rates than what venture capitalists expect.

Returns to Investors Just as the Bondholders expect to receive periodic balloon payments for their investments, the Investors (the tree lot managers) must also receive substantial returns. To ensure such high returns the Investors must plant one extra tree for themselves for each tree sold to a Bondholder. By doing this the Investors can expect to receive extremely high returns, much higher than those expected by the Bondholders. It is presumed that these returns must be significantly higher in order to entice Investors to embark on the establishment and management of such programs. Our rule of thumb in designing these programs has been that Investor returns should be double the rates projected for the Bondholders. Given the estimated growth rates of the trees and their product prices, it has been possible to fix the bond prices in such a way as to generate return rates for Bondholders ranging from 20% to 40% with corresponding returns for Investors at twice these levels.

Although this paper discusses and promotes the idea of "tree bonds" for non-food crops using waste water irrigation, "tree bonds" have been used for fruit and nut trees in other countries. Comparisons of what a "tree bond" program would look like for such trees has also been calculated and included in the summary table of the analyses.

Table 1. Summary Analysis for Various "Tree Bond" Programs

Plan	Bond Price	Bondhldr's Returns	Investor's Investment	Investor's Returns	Investor's Returns (w/o bonds)	Plan Years	Net Present Value @12%
Mahogany/Pplr	($20.00)	40%	($294,000)	80%	59%	15	$4,807,816
Casuarina	($1.75)	34%	($300,000)	60%	36%	5	$429,324
Cypress	($1.75)	36%	($300,000)	62%	19%	5	$477,472
Eucalyptus	($2.50)	35%	($300,000)	38%	20%	5	$336,562
Neem	($2.50)	36%	($300,000)	39%	21%	5	$353,960
Mahogany	($20.00)	30%	($294,000)	44%	30%	15	$3,861,049
Zanzalekh	($1.50)	30%	($300,000)	34%	18%	5	$152,357
Ornamentals/fd (w/o land costs)	($1,500)	25%	($300,000)	36%	69%	10	$1,154,815
Ornamentals/fd (w/ land costs)	($2,000)	18%	($800,000)	16%	18%	10	$309,789
Fruit/Nuts (w/land costs)	($4.00)	18%	($800,000)	18%	18%	10	$1,204,476
Mulberry/Silk (one feddan w/o mahogany)	($25.00)	28%	($5,931)	30%	33%	10	$9,533
Mulberry/Silk (w/factory shares w/o mahogany)	($25.00)	28%	($1,500)	67%		15	$8,271
Mulberry/Silk (one feddan w/ mahogany)	($25.00)	28%	($1,500)	159%		15	$7,119
Mulberry/Silk (w/factory shares w/mahogany)	($25.00)	28%	($1,500)	208%		15	$10,553

IV. Internal Rates of Return for Different Tree Combinations

Table 1 shows that the Bondholder returns for mahogany grown with an under-growth of poplars has the highest returns. The tree bonds are set at $20 per mahogany tree and the bonds return over $1.000 in fifteen years. The Investors earn returns of double that amount. or 80% for the "extra" tree they plant for each tree financed by a "tree bond". The next highest set of returns are for five year stands of casuarina or cypress. The bond prices for these trees are only $1.75 per tree and they pay $8 in five years, a return rate of 35%. The Investors in this case (once again planting one tree for themselves for every tree sold to a Bondholder) earn 60% in five years. Eucalyptus and neem trees have bond rates of $2.50 and pay $11 in five years and their Investors roughly 40%. Mahogany without the intercropped poplar earns 30% for the Bondholder and 44% for the Investor. The table presents the calculations for returns on ornamentals, mulberry for silk worms, and an indicative example for fruit or nut trees. Each selection of tree crop or combination of trees yields slightly different returns to Bondholders and Investors. Nonetheless, all the returns are higher than the currently available bond markets. It is up to the plot managers, the "Investors", to select what crop they want to grow and design the tree lot configuration according to their own preferences. There are limitations as to what crops can grow in different climatic areas and to what extent trees can be grown on delta lands. Each Investor will have to sort out these limitations for themselves. Needless to say, these programs appear to be extremely lucrative for all parties.

V. Financing Investments through "Tree Bonds"

Egypt has been experiencing a liquidity slump in recent months. Capital to finance exotic investments has dried up. Privatizations of Government-owned companies have slowed considerably, even for companies with healthy balance sheets. Direct loan financing for large tracks of land at $1,500 per feddan are not readily available. However, the public is poised to enter the capital markets if financial instruments could be designed for the small amount of investment capital that they have available, ranging from LE 170 ($50) to LE 1,020 ($300).

In India, where they introduced the "tree bond" concept, thousands of bondholders were enticed into investing from $100 to $200 dollars for the production of teak and cypress, with return rates of between 30% to 40%. It is suspected that a similar situation would occur in Egypt if such financial instruments could be legally placed in the market, with the understanding that the normal civil codes would govern their behavior and prevent moral hazard[2]. This analysis has shown that Egypt has all the ingredients for a successful and viable "tree bond" program. The waste water must be flushed through agricultural land on which only trees or other non-food crops are allowed to grow. This is an environmental mandate. The amount of water that needs to be treated this way could irrigate thousands of feddan of tree plots. Our estimates of the growth of the trees irrigated with waste water, based on the observations of several trial plots, indicates that the economic value of the harvested trees would make the bonds very attractive to the Bondholders. And lastly, the tree lot managers (Investors), would make returns at twice the

[2] Moral hazard in this case would be if a bond issuer would abscond with the bondholders money without guaranteeing payments of the value of the mature trees.

rate of the corresponding Bondholders[3]. It should now be possible to design a "tree bond" program.

VI. Using Mulberry "Tree Bonds" to Finance A Silk Yarn Spinning Factory

Waste water can be used to irrigate mulberry bushes, whose branches and leaves are fed to silk worms. Hybrid worm breeding in Egypt has produced some of the best quality and highest output worms in the world. A silk worm greenhouse has been designed for three feddan of mulberry. A tree bond program has been developed for each feddan. The farmers can finance part of their investment by selling tree bonds. Mahogany trees can also be planted amongst the mulberry to give higher returns to the Bondholders. But the most interesting use of the bond income, with or without the mahogany trees, is to invest it in shares of a silk yarn spinning factory. If 40% of the bond receipts are invested in the factory, returns to the farmers increase to 50% to 70%, depending on the dividends from the spinning factory. If mahogany is interplanted with the mulberry then only 25% of the bond receipts are needed for the spinning factory shares and returns to the farmers go over 200%.

VII. Proposal

Based on the information provided in this report, it appears that various "tree bond" programs are feasible. This report, authored by the APRP based on information available at Sadat City and from other plantations of trees throughout the country, will be presented by the Ministry of Agriculture at a series of workshops at which several investment brokers will be present. Potential "Investors" (tree plot managers) will also be invited. Amongst them they will decide how to design and manage this program. The APRP suggests that one or several investment brokers agree to form a company or trust that will issue the bonds to the public, hand over the value of these purchases to the "Investors", hold the "Investors" responsible (by contract or other form of indemnity or collateral) for delivering the trees or products to the market on the due dates, collect the monies from these sales, and distribute the proceeds to the Bondholders on schedule. The group that meets to discuss this program will determine how it should be designed, what guarantees would be required for each player, what the function of an "oversight committee" should be and how it should be formed, and what actions each participant will be expected to take. Annex I has a copy of the brochure of the original Indian teak and cypress tree bond program. The MALR may decide to test this idea by issuing bonds for the trees already under production at various sites such as Luxor, Ismailia, and El Kharga.

VIII. Calculations for each "Tree Bond" Program

There are many choices facing investors with regard to the design of a tree bond program. The investor must decide how to structure each program, in terms of which trees to plant, how often to harvest, and how to set the bond prices and return rates. There is no fixed format for any of these selections. There will be an oversight committee to review the final designs to assure

[3] It should be pointed out that the calculation of the internal rate of return (IRR) for the plot managers is undefined because the proceeds of the bond sales exceeds the investment in establishing the plots and setting up the irrigation system. But for purposes of demonstration we have calculated the IRR's using the cost of plot establishment as the equity investment in year 0.

the financial brokers that the programs are economically viable. A program document will also be required that will explain what the investors are planning to do and how they will implement their plan, which will be presented to the oversight committee. This committee will supervise and enforce the contract that will be established between and amongst all parties, that will lay out the "business plan" that the investors will follow. This document will describe in detail all aspects of the implementation plan and schedule. Some critical aspects of the sample plans presented in the summary table are presented below.

1. Mahogany and Poplar Tree Bond Program

Basic Assumptions and Calculations

Trees per feddan	250 mahogany, planted 4.0 meters x 4.0 meters; 1.890 poplar spaced at 1.33 meters by 1.33 meters within the 4 x 4 square of the mahogany.
Harvesting times	The mahogany will be harvested at 15 years; the poplar will be harvested at 5 years. Poplar may be replanted for another five years before harvesting the mahogany.
Volume at harvest	Mahogany = 1.33 cubic meters at 15 years. Poplar = .29 cubic meters at 5 years.
Prices of harvested wood	$3.00 per board foot for mahogany; $.07 per board foot for poplar
Establishment costs for an irrigated feddan; and for 200 feddan.	$1,500 (LE 5,000) per feddan; $300,000 for 200 feddan
Maintenance costs per feddan; per 200 feddan.	$350 (LE 1,200) per feddan, $70,000 for 200 feddan
Bond price	Depending on the return rate required, the price will vary from $20 to $25. For this example it is $22.
Payout program to Bondholders	The poplar pays at harvest time (year 5) approximately $100; the mahogany will pay approximately $1,000 or more in 15 years, depending on the price of mahogany at that time.
Number of Bonds Sold	Bonds will be sold for 100 feddan of mahogany, at 250 trees per feddan which is 25,000 bonds.
Bond receipts	$22 x 25,000 = $550,000.

Investor Income in year 15 & NPV	Year 15 income = $25,000,000, Net Present Value = $4,800,000 at 12% discount rate.

Calculations:

Returns to Bondholder	40%
Returns to Investor	80%

Discussion: Five years of testing of the mahogany using waste water has shown that the trees grow quite rapidly under these conditions in Luxor. The trees are planted in desert soils, not river delta soils. Spacing is 4.0 meters by 4.0 meters. Three meter spacings are also being tested. Trials are also underway to test hillside rather than flat cultivation. All test results are positive. Based on a regression analysis of the all the mahogany trees available – those under current testing in Luxor, the trees that are twenty years old or more in front of the MALR offices in Luxor and the trees in Kitchner's Botanical Island in Aswan - it has been possible to make these estimates of tree volumes at fifteen years. It is suggested that poplar be planted in between the mahogany with a 1.33 meter by 1.33 meter spacing (giving 15 trees for each 4 x 4 mahogany square). Although this pattern of associated tree croppings has not been tested, it is expected that the poplar trees will grow at similar rates compared with other poplar testing sites in the MALR Afforestation Department's nurseries and experimental trial sites around the country, especially in Cairo along the Nile.

The tree plots that have been investigated follow a rigorous schedule of irrigation using the waste water from the local Stage II treatment plant. Every precaution is taken to insure that the trees remain disease free. No fertilizer is applied because the waste water is rich in these elements.

Current prices for mahogany are quite high. Retail prices for a board foot of mahogany for cabinetry and furniture are over $15 per board foot. The price used for the calculations in this model is conservatively pegged at $3.00 per board foot. However, slightly increasing or decreasing the price of mahogany has little effect on return rates to either the Bondholders or the Investors. The poplar is priced at 7 cents (U.S.) per board foot (which is LE 100 per cubic meter). This is the current price for wood that is used in making chipboard. The poplar can be used for chipboard, pulp or flooring, moldings, etc. Changing the price slightly up or down will not alter the return rates significantly. What is most important is estimating the volume of wood produced during the time frame designated before harvesting and the choice of the harvesting date. Further simulations will be carried out in order to maximize the return rates to all parties.

2. Mahogany (without Poplar) Tree Bond Program

Basic Assumptions and Calculations

Trees per feddan	250 mahogany, planted 4.0 meters x 4.0 meters;
Harvesting times	The mahogany will be harvested at 15 years, with perhaps some thinning in earlier years.

Volume at harvest	1.33 cubic meters
Price of harvested wood	$3.00 per board foot for mahogany
Establishment costs for an irrigated feddan	$1,500 (LE 5,000) per feddan, $300,000 for 200 feddan
Maintenance costs per feddan	$350 (LE 1,200) per feddan, $70,000 for 200 feddan
Bond price	Depending on the return rate required, the price will vary from $20 to $25. The price for this example is $20.
Payout program to Bondholders	The mahogany will pay approximately $1,000 or more in 15 years, depending on the price of mahogany at that time.
Bond receipts	$20 x 25,000 = $500,000.
Investor Income in year 15 & NPV	Year 15 income = $25,000,000, Net Present Value = $4,800,000 at 12% discount rate.

Calculations:

Returns to Bondholder	30%
Returns to Investor	40%

Discussion: This bond program is different from the first one because it does not include any poplar mixed in amongst the mahogany during its earlier years. All other parameters are the same and the return rates reflect the lack of early harvest of poplar. This means that the Bondholder will have to wait until the 15th year to receive any returns, whereas in the former program a $100 payment is made in the fifth year. It might be possible to increase the planting density of the mahogany because there will be no undergrowth crop. The 3.00 meter by 3.00 meter planting rate could be used in this case and this would increase the Investor returns by a significant amount. Income in year 15 would be $44,000,000 and the net present value would be $8.5 million under the higher planting density..

3. Casuarina Tree Bond Program

Basic Assumptions and Calculations

Trees per feddan	2,560 casuarina trees per feddan, planted 1.25 meters x 1.25 meters;
Harvesting times	The casuarina trees will be harvested in five years for pulp paper or chipboard.

Volume at harvest	.48 cubic meters
Price of harvested wood	$.04 per board foot for casuarina
Establishment costs for an irrigated feddan	$1,500 (LE 5,000) per feddan, $300,000 for 200 feddan
Maintenance costs per feddan	$350 (LE 1,200) per feddan, $50,000 for 200 feddan
Bond price	The bond price for this example is $1.75.
Payout program to Bondholders	The casuarina will pay $7.66 in the fifth year.
Bond receipts	$1.75 x 2,560 = $448,000.
NPV of Investor Income	Net Present Value = $429,324 at 12% discount rate.

Calculations:

Returns to Bondholder	34%
Returns to Investor	60%

Discussion: Casuarina grows faster than the mahogany and has been tested in the Cairo lattitudes. But these faster growing woods are not prime cabinetry or furniture woods. For that reason we are considering growing them for pulp for making paper and for use in chipboard (MDF = medium density fiberboard). Since both paper and fiber board is currently imported, these production plans will fill a critical need for these industries. We are considering harvesting at five years but further analysis may demonstrate that other harvesting times will be more profitable.

The price we have used is 4 cents (U.S.) per board foot or $17 a cubic meter (LE 58), and it is assumed that the entire tree would be used in pulp making and fiber board, that is the trunk, branches and all.

4. Cypress Tree Bond Program

Basic Assumptions and Calculations

Trees per feddan	2,560 cypress trees per feddan, planted 1.25 meters x 1.25 meters;
Harvesting times	The cypress trees will be harvested in five years for pulp paper or chipboard.

Volume at harvest	.50 cubic meters.
Price of harvested wood	$.04 per board foot for casuarina
Establishment costs for an irrigated feddan	$1,500 (LE 5,000) per feddan, $300,000 for 200 feddan
Maintenance costs per feddan	$350 (LE 1,200) per feddan, $50,000 for 200 feddan
Bond price	The bond price for this example is $1.75.
Payout program to Bondholders	The cypress will pay $8.04 in the fifth year.
Bond receipts	$1.75 x 2,560 = $448,000.
NPV of Investor Income	Net Present Value = $477,472 at 12% discount rate.

Calculations:

Returns to Bondholder	36%
Returns to Investor	62%

Discussion: This program is almost identical to the casuarina program with only slightly different growth rates in five years.

5. Eucalyptus Tree Bond Program

Basic Assumptions and Calculations

Trees per feddan	1,000 eucalyptus trees per feddan, planted 2.0 meters x 2.0 meters;
Harvesting times	The eucalyptus trees will be harvested in five years for pulp paper or chipboard.
Volume at harvest	.94 cubic meters.
Price of harvested wood	$.03 per board foot for eucalyptus
Establishment costs for an irrigated feddan	$1,500 (LE 5,000) per feddan, $300,000 for 200 feddan

Maintenance costs per feddan	$350 (LE 1,200) per feddan, $50,000 for 200 feddan
Bond price	The bond price for this example is $2.50.
Payout program to Bondholders	The eucalyptus will pay $11.32 in the fifth year.
Bond receipts	$2.50 x 1,000 = $250,000.
NPV of Investor Income	Net Present Value = $336,562 at 12% discount rate.

Calculations:

Returns to Bondholder	35%
Returns to Investor	38%

Discussion: The eucalyptus and the neem trees grow somewhat faster than the casuarina and cypress, but it is estimated that their price is slightly less. (3 cents compared to 4 cents per board foot.) The explanation for the eucalyptus is that it contains a resin which is difficult to extract – it often requires complete boiling to remove it prior to processing. The neem tree is used as a base for pesticides in India, but the wood is not highly valued as are the others. It is not certain what its preference would be in making pulp or chipboard, so the lower price is used in this estimation.

6. Neem Tree Bond Program

Basic Assumptions and Calculations

Trees per feddan	1,000 neem trees per feddan, planted 2.0 meters x 2.0 meters;
Harvesting times	The neem trees will be harvested in five years for pulp paper or chipboard.
Volume at harvest	.96 cubic meters.
Price of harvested wood	$.03 per board foot for neem
Establishment costs for an irrigated feddan	$1,500 (LE 5,000) per feddan, $300,000 for 200 feddan
Maintenance costs per feddan	$350 (LE 1,200) per feddan, $50,000 for 200 feddan

Bond price	The bond price for this example is $2.50.
Payout program to Bondholders	The neem tree will pay $11.50 in the fifth year.
Bond receipts	$2.50 x 1,000 = $250,000.
NPV of Investor Income	Net Present Value = $353,960 at 12% discount rate.

Calculations:

Returns to Bondholder	36%
Returns to Investor	39%

Discussion: See the discussion for eucalyptus.

7. Zanzalekh Tree Bond Program

Basic Assumptions and Calculations

Trees per feddan	2,560 zanzalekh trees per feddan, planted 1.25 meters x 1.25 meters;
Harvesting times	The zanzalekh trees will be harvested in five years for pulp paper or chipboard.
Volume at harvest	.35 cubic meters.
Price of harvested wood	$.04 per board foot for zanzalekh
Establishment costs for an irrigated feddan	$1,500 (LE 5,000) per feddan, $300,000 for 200 feddan
Maintenance costs per feddan	$350 (LE 1,200) per feddan, $50,000 for 200 feddan
Bond price	The bond price for this example is $1.75.
Payout program to Bondholders	The eucalyptus will pay $5.55 in the fifth year.
Bond receipts	$1.75 x 2,560 = $448,000.
NPV of Investor Income	Net Present Value = $152,357 at 12% discount rate.

Calculations:

Returns to Bondholder	30%
Returns to Investor	34%

Discussion: This tree is a local tree used for construction and furniture. It is not certain how it would perform for making pulp, chipboard or cabinetry. Using the same values for the different parameters as for the casuarina and cypress, the returns to zanzalekh production are slightly lower than for the others, due to the lower volume at harvest.

8. Ornamentals Bond Program

Basic Assumptions and Calculations

Plants per feddan	2,000 ficus plants and 2,000 decorative palm per feddan, planted 1.0 meter x 1.0 meter;
Harvesting times	The plants will be harvested once a year.
Price at harvest	$.29 for each ficus plant and $.59 for each decorative palm.
Establishment costs for an irrigated feddan	$1,500 (LE 5,000) per feddan, $300,000 per 200 feddan.
Land costs (if land has To be purchased.)	$2,500 per feddan.
Annual Operating costs per feddan	$1,000 (LE 3,400) per feddan, $200,000 for 200 feddan
Bond price	The bond price for this example is $2,000 per feddan if land costs are included. If land costs are not required then the bond price is $1,500 per feddan.
Payout program to Bondholders.	The ornamental bonds will pay $549 each year for 9 years starting in the second year.
Bond receipts w/ land costs	$2,000/feddan x 100 feddan = $200,000.
NPV of Investor Income (w/land costs)	Net Present Value = $309,789 at 12% discount rate.
Bond receipts w/o land costs	$1,500/feddan x 100 feddan = $150,000.

NPV of Investor Income (w/o land costs)	Net Present Value = $1,154,815 at 12% discount rate.

Calculations:

Returns to Bondholder without land costs.	25%
Returns to Bondholder with land costs.	18%
Returns to Investor without land costs.	36%
Returns to Investor with land costs.	16%
Returns to Investor w/o bonds or land costs.	69%
Returns to Investor w/o bonds but including land costs	18%

Discussion: It may be feasible to grow ornamentals underneath the trees. This would add significantly to the return rates for the tree programs. But the inability to access the ornamentals to harvest them and to get in and out of the plantation to cultivate these plants may limit their potential as associated crops with the fast growing trees that are planted 1.25 meters apart. However, grown by themselves, they are a viable and potential crop for a bond program using waste water. Because ornamentals are not consumed by humans or animals (that are consumed by humans) they qualify for using waste water. Moreover, they give returns each year and for this reason they avoid the typical problem of growing trees which is waiting several years for the first returns. In this case, ornamentals are simply a different kind of annual cash crop that can use waste water. For this reason it is questionable whether a bond program would be required, or even appropriate. Investors may just have to finance the investments themselves.

9. Fruit/Nut (Almonds) Tree Bond Program

Basic Assumptions and Calculations

Plants per feddan	250 almond trees per feddan, planted 4.0 meters by 4.0 meters
Harvesting times	The plants will be harvested once a year, commencing after the fourth year.
Price at harvest	$3.53 per kilogram of nuts (will vary according to the market.).
Establishment costs for an irrigated feddan	$2,500 (LE 8,400) per feddan, $500,000 per 200 feddan.

Land costs (if land has to be purchased.)	$2,500 per feddan.
Annual Operating costs per feddan	$500 (LE 1,700) per feddan.
Bond price	The bond price for this example is $4 per tree.
Payout program to Bondholders.	The almond trees will pay out according to the harvest of nuts per tree over 15 years. Total net present value of the payout is estimated at $9.00 per tree over 15 years.
Bond receipts w/ land costs	$4/tree x 250 trees x 100 feddan = $100,000.
NPV of Investor Income (w/land costs)	Net Present Value = $602,238 at 12% discount rate.

Calculations:

Returns to Bondholder without land costs.	18%
Returns to Investor without land costs.	18%
Returns to the Investor without bonds	18%

Discussion: Fruit and nut trees are grown in the new lands and in the Delta. These trees have a similar problem compared to the other tree crops in that their first fruits take several years to mature before they bear fruit or nuts for harvest. However, these trees are not allowed to be grown using waste water because they are food crops. As a result the investment costs must include land costs. The tree bond program which we have designed for fruit or nut trees are based on information obtained from interviews with almond farmers in El Arish. The information is presented here to serve as a comparison for the non-edible wood trees and ornamentals. Returns to the Bondholders and the Investors are the same in this case, at 18%. First fruits arrive in year four, increase to year ten and then begin to decline. Because of the land costs, total investment costs are higher for these trees than for the trees using waste water, where land is provided at relatively no cost.

10. Mulberry for Silk Bond Program

Basic Assumptions and Calculations

Mulberry trees per feddan	3,500 per feddan, planted 1.25 meters x 1.25 meters;

Mahogany trees	150 per feddan.
Harvesting mulberry	The leaves/branches are harvested daily for the silk worms. Three feddan are required to feed a silk worm greenhouse hut.
Harvesting mahogany	The mahogany is harvested at 15 years.
Establishment costs for one feddan of mulberry Greenhouses (one for each three feddan)	Land costs = $1,500 (LE 5,000) per feddan. Mulberry trees = $1,029 per feddan $4,902 per feddan (LE 50,000 per three feddan)
Silk income per year	30 boxes/feddan; 40 kg./box; $3/kg = $3,600 income/year. Expenses per year = $800; Net income = $2,800/year/feddan
Bond price	The bond price for this example is $25 without mahogany; $40 with mahogany.
Payout program to Bondholders	The Bondholders receive $10 per year for 9 years (starting 2nd year) without mahogany, and $10 per year for 14 years (starting 2nd year) plus $1,011 in the 15th year with mahogany.

Calculations:

Returns to Bondholder without mahogany	28%
Returns to Bondholder with mahogany	32%
Returns to Farmer without bonds, including land costs	26%
Returns to Farmer without bonds, without land costs	35%
Returns to Farmer with bonds, including land costs	20%
Returns to Farmer with bonds, without land costs	30%
Returns to Farmer with bonds, without land costs, and 100% financing	37%

of farmer's costs

Returns to Farmer when bonds are used to finance silk factory without mahogany.	67% (when returns to investment in silk factory are 63%) 56% (when returns to investment in silk factory are 30%)
Returns to Farmer when bonds are used to finance silk factory with mahogany.	208% (when returns to investment in silk factory are 63%) 204% (when returns to investment in silk factory are 30%)

Discussion: By far the most complex case for "tree bonds" is that involving the production of mulberry for feed to silk worms to produce silk cacoons. Farmers in this case would be the "investors" and they would be required to have three feddan of mulberry for each silk worm greenhouse hut. The farmers would then sell "bonds" to the public for a stake in the output of the greenhouses. Bonds would be priced at $25 for mulberry without interspersed mahogany, and $40 if mahogany is planted. Returns to the Bondholders would be 28% without mahogany and 32% with mahogany. (See above). The farmers, on the other hand, have several options. If they have to pay for their land, their investments are higher and their returns are lower. If they obtain the land free to use, the same as those who receive land for trees, then their returns are higher. With land costs their returns are 26%, without land costs 35%. If they finance their investment with bonds, they obtain returns of 20% with land costs and 30% without land costs. If they finance their initial investment without bonds and no land costs, their returns are 37%. But, if they use their bond income to help finance the silk factory (i.e. purchasing shares in the silk factory with their bond receipts) then their returns jump to 50% to 70%, depending on the percentage of equity earnings the silk factory distributes as dividends. And if they have mahogany interplanted with the mulberry under this scenario, their returns skyrocket to over 200%.

IX. Conclusions

The conventions used in the design of these "tree bond" programs can be altered. Bond returns can be based on the output from one assigned tree or from more than one tree. Returns can include income generated from associated or undergrowth crops in various combinations. Investor returns can be reduced to increase Bondholder returns or vice versa. Proceeds from the bonds might be used to purchase par value zero coupon bonds which mature in 7 to 10 years so that the original bond purchase price is guaranteed to the Bondholder. Investors may guarantee a certain amount of wood to be harvested at a given price instead of assigning each bond to the actual yield of a designated tree. Any and all combinations of the above can be employed in the design of the "tree bond" program.

As this program evolves the oversight committee or the bond brokers may insist that the Investors must choose from a set of predetermined cropping patterns and bond prices and earnings schedules. In principle, the Investor should be able to design his or her own program, but if the brokers are to be responsible to the Bondholders for the payouts, the brokers may determine that it would be too risky to allow each Investor to design their own program. In this

way the technical staff of the MALR and the financial experts of the bond broker's team would design the "tree bond" programs and then have a list that would be appropriate for any location from which the Investors would select their preferred model.

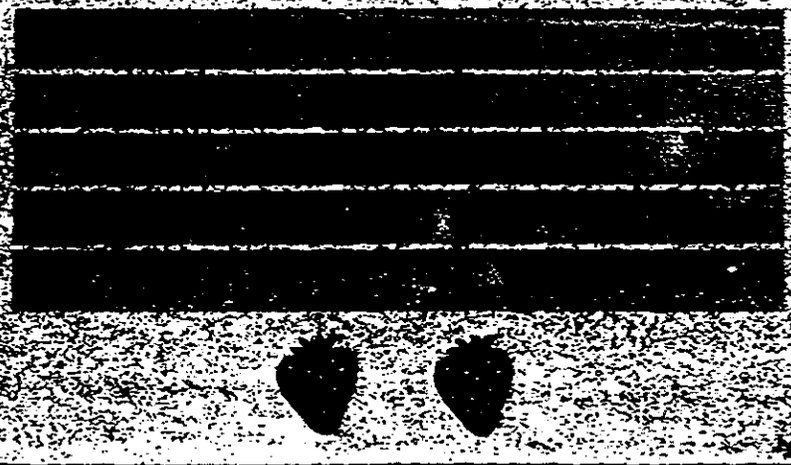
Annex I. Copy of the "original" Indian Tree Bond Program

AFTER THE SUCCESS OF GROWTH BOND IN 1993,
ADVENTURE GROUP BRINGS YOU THE NEXT SUPERSCHEME

INVEST Rs.3,60,000 AND EARN

ADVENTURE PLANTATION LIMITED

GROWTH BOND II



Adventure Plantation Ltd., Bombay

An Adventure Group Company

HOW DO YOU INVEST YOUR PRECIOUS MONEY?

Most people invest for higher returns. But a few people go further.

They invest to ensure a trouble-free future.

They begin by thinking what might happen in their lives fiifteen years from now. Next they estimate how much money they might need at that time. Finally they look for an investment opportunity that would deliver the required money on time.

You might need money in future for just anything - house, car, education, wedding, business, travel abroad, health emergencies, old age, even a hedge against inflation !

It does make great sense to ensure a trouble-free future for yourself because you are going to spend a lot of time there soon.

That is why it makes us particularly happy to bring you just such an investment opportunity : Growth Bond II.

Like all ideal investments, Growth Bond II needs little investment amount, and brings returns as high as sixty times in only fifteen years - all of it tax - free !

Welcome to a trouble-free future ! Welcome to Growth Bond II !

NOW IS THE TIME FOR GROWTH BOND II

As you drive from Bombay towards Pune, take a right turn at Kamshet village after Lonavala. The road winds through gorgeous mountainous terrain for the next 45 kms till you turn right again towards the Mulshi dam - and there you are at the sprawling fields of Growth Bond II.

250 acres. Fertile red soil. Ideal climate. Plenty of water. Plenty of power. In Mulshi taluka of Pune District. 165 kms from Bombay, 45 kms from Pune.

This is the land where a large plantation of strawberry, teak, and sevan would soon rise to lush growth under the care of experienced agro-experts using the world's leading agro-technology.

Strawberry, teak, and sevan are all high value commercial crops. They enjoy excellent home and overseas markets. Their demands are rising steadily. Their prices are rising steadily. That is why for years to come these three crops will continue to fetch the best possible returns tax-free !

Which means now is the time for you to reach for these best possible returns. Now is the time to invest in Growth Bond II.

GROWTH BOND II

* Growth Bond II offers you a choice of four schemes A, B, C and D. All schemes run for 15 years.

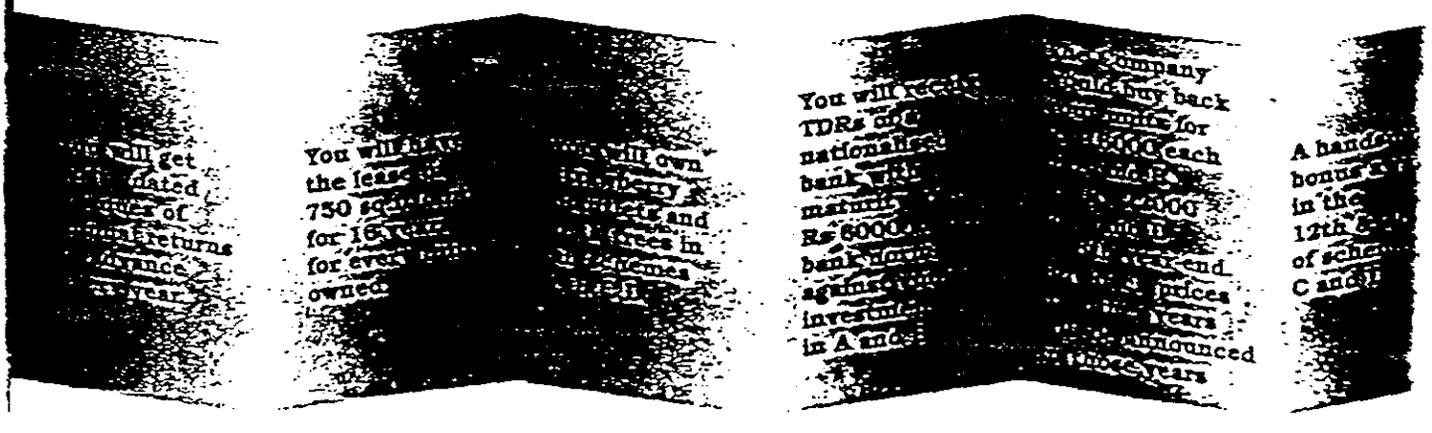
and a unit in every scheme is yours for only Rs 6000. You can have as many units as you like.

GREAT RETURNS,

Growth Bond II Schemes	A	B	C	D
Value of a Unit	Rs. 6000	Rs. 6000	Rs. 6000	Rs. 6000
Duration of Scheme	15Years	15Years	15Years	15Years
Annual Returns in : Year 2	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 3	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 4	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 5	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 6	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 7	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 8	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 10	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 11	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 13	Rs. 900	Rs. 900	Rs. 1200	Rs. 1200
Year 14	Rs. 900	RS. 900	Rs. 1200	Rs. 1200
Return of Unit Value Year 15	Rs. 6000	Rs. 6000	Rs. 6000	Rs. 6000
Total Returns in 15 Years	Rs. 210000	Rs. 300000	Rs. 270000	Rs. 360000
Unit Value Grown by	35 Times	50 Times	45 Times	60 Times

All Returns are from the Sales Proceeds of Strawberry, Teak, and Sevan.

... AND MAXIMUM SECURITY !



HIGH TECHNOLOGY BUMPER CROP / HIGH PRICES BUMPER PROFITS

How is it possible to turn a mere Rupees 6000 into a Whopping Rupees 3.60.000 in only 15 years ?

Is it possible? Yes !

How? The secret lies in two high points : High Technology, and High Prices.

High Technology

Growth Bond II plantation will grow into high success with the help of the latest agro-technology.

Strawberry plantlets, and teak / sevan saplings are coming from renowned tissue culture labs. Microprocessor controlled fertigation and micro-irrigation systems (including the latest microdrip system and muti-outlet drippers) ensure correct and timely applications of water, fertiliser, nutrients, pesticides, and fungicides. Greenhouse tunnels, solar captivators, soil drainage, mulching, streamlined picking, pre-cooling system, refrigerated transport etc promote fuller growth, timely maturity and longer shelf - life. The High Density Agro Forestry technique yields trees that are straighter, taller, and wider than normally grown trees.

Additional plantation, water storage, lift irrigation, and crop insurance will be provided to manage adverse effects of unforeseen climatic variations. Qualified agro-experts shall monitor all operations personally with computerised systems.

Growth Bond II is designed to yield premium fruits and timber that would fetch the best prices in the world markets.

High Prices

Strawberry, teak, and sevan are all high ticket items.

Strawberry is the fruit of tomorrow. A delicious sweet-sour fruit, strawberry is becoming widely popular as a table fruit, and used in jams, jellys, syrups, crushes, squashes, and icecreams. Under right conditions, strawberry comes to fruit within 90 days of planting, and can be sent immediately to ready markets anywhere in the world.

Teak of course remains the all-time favourite. Valued as the first-rate timber since centuries, teak continues to be in great demand all over the world in furniture-making, construction, etc.

Sevan is a fast-growing tree (like white Cedar) known for its teak-like qualities. Its wood finds wide use in light furniture, boatmaking, shipbuilding, bridgework, music instruments, picture frames, jute bobbins, shafts, axles, venetian blinds, etc. Its leaves and roots are renowned for medicinal applications.

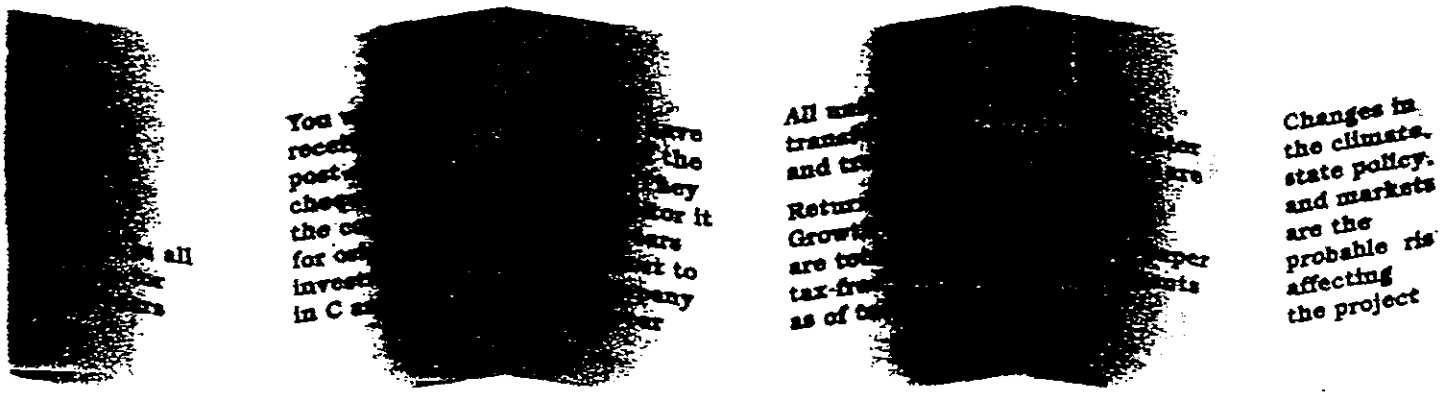
Strawberry today sells for Rs 200 per kilo. A cubic foot of teak fetches about Rs 1000. Sevan goes for Rs. 500 per cubic foot. As the demands for them are rising sharply but not the supply, prices are looking up everywhere.

High Returns

Now combine these two features : high technology yielding bumper crops, and high prices fetching bumper profits.

There you have the secret of your high returns.

Growth Bond II is the first to spot this rich opportunity, and bring it to you for "money" happy returns.



EXPERIENCE + EXPERTISE + EVALUATION + EXTRA SOMETHING

PAST EXPERIENCE

Growth Bond II comes to you from the Adventure Group the same group that launched Growth Bond in 1993 with huge success.

Growth Bond is a 100 - acre teak plantation near Mangaon in Raigad district of Maharashtra. Growth Bond scheme opened for investment in July 1993, and all units were snapped up by 10,000 investors in just four months ! Growth Bond remains one of the most successful plantation schemes of the recent times.

Growth Bond plantation is progressing on schedule. All investor agreements have been duly prepared, signed, and delivered to all investors in India and abroad. The riverside farm has been fully developed - boundaries erected, roads laid, sheds built, power supply installed, and irrigation facilities set up. The plantation of teak saplings is complete too.

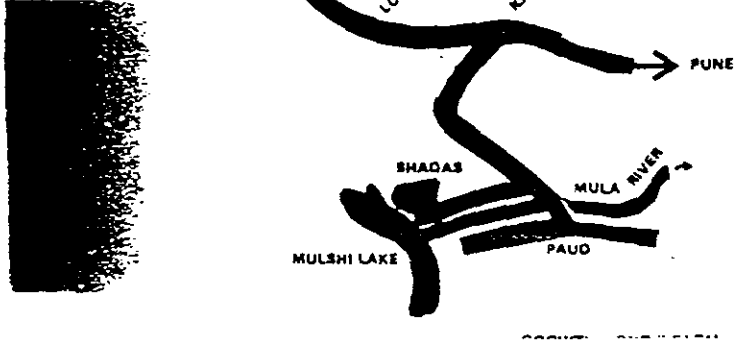
Rains have fallen, the saplings have grown, and all agromanagers are on the farm monitoring daily operations. Several investors have already visited the farm, and seen the progress.

Growth Bond has promised up to 45 times returns in 12 years. It is a promise that is well on its schedule -exactly as planned!

WIDE EXPERTISE

World-known agrocrat Dr V J Patel along with agronomist Dr S N Pande, horticultural advisor Mr O P Grover and former Inspector General of Forests Mr Y G Jadhav bring to Growth Bond II technical competence of immense value.

The board of directors is led by Mr Vijay Page who brings rich administrative experience and intimat knowledge of regional horticulture gathered durin his tenure as the chief executive officer of the Konka Development Corporation. Other directors hav already scored a winner in their first project Growt Bond.



Ein-Tal (1983) Ltd of Israel and their Indian associat NTB Bowsmith Irrigation are supplying state-of the-art micro-irrigation and micro-processe controlled fertigation systems which are known a over the world.

Yehuda Romano Flower Nursery of Israel ar providing strawberry planting material of the be quality along with expert assistance during plantin flowering, and harvesting stages. They will als source a marketing cooperative Agrexco of Israel t market Growth Bond II strawberries in the worl markets under a favourite brand name.

UV Consultancy enrich Growth Bond II with the project experience in plantation schemes launche in recent times.

FULL EVALUATION

It is this strong combination of experience ar expertise that has won for Growth Bond II fu evaluation from the leading project consultan MITCON (Maharashtra Industrial & Technic Consultancy Organisation Ltd.). MITCON is a joi venture of ICICI, IDBI, IFCI, state governme corporations and banks.

MITCON has examined agricultural, financi technological, marketing, managerial, and gene aspects (including returns to investors) of Grow Bond II, and appraised it as fully feasible.

MITCON will now monitor the progress of Grow Bond II for the next fifteen years, and submi progress report every year. Copies of these repo will be sent to all unit holders by Advent Plantation Ltd.

EXTRAORDINARY OFFER

Most plantation schemes offer high returns investors - not in money, but in so many cubic f of wood !

Growth Bond offers you actual money, not wood

You will begin to collect your returns every year the next fifteen years in money ! In money tha specified today ! In money that is assured on sta

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THE NEW INDIA ASSURANCE COMPANY

DENA BANK

FIRST - COME - FIRST - SERVED

Units of Growth Bond II are available strictly on a first come - first - served basis.

Since only a limited number of units is available fo investment, the sooner you buy your units the better.

1. Collect an application form from Adventure Plantation Ltd or a Growth Bond II agent.
2. Fill in the form, and return it with full payment to your agent. Alternately, you could mail your form and payment cheque directly to our administration office in Bombay. All out-of-Bombay payments should be made with a demand draft drawn in favour of "Adventure Plantation Ltd" made payable at Bombay.
3. Within 60 days of receiving your application form and payment, we will mail you an agreement, unit certificate, fixed deposit receipts, post-dated cheques etc by registered post A.D.
4. You will continue to receive annual progress reports, and annual returns in time. Any correspondence about buy - back, transfer, change of address etc should be sent to our administration office.

ADVENTURE PLANTATION LIMITED GROWTH BOND

ADVENTURE PLANTATION LIMITED

REGISTERED OFFICE : Prabhuta, 21 Hughes Road, Bombay 400 007 Tel : 361 9575, 363 2691, 364 3474, Fax : 364 3475

ADMINISTRATION OFFICE : 131 Panchratna, Mama Paramananda Road, Opera House, Bombay 400 001 Tel : 361 1151, 363 7164

BRANCH OFFICE Jai Gangeshwar Society, Opp Neelam Restaurant, Third Road, Khar (West), Bombay 400 052

Tel : 648 2220, 648 3274 Fax : 648 3223

Money From Trees

Bored by mutual funds? Try high-growth mangos

By Nityanand Jayaraman in Madras

The neatly fenced, 66-acre farm plot outside Madras looks just like its description in the Maxworth Orchards investment promotion kit. Irrigation pipes drip-feed water to tightly planted rows of mangos. Between the rows grow pomegranates, the "intercrop" of this orchard, which uses "new scientific methods." And where there's room, the orchard's 15 full-time labourers have planted vegetables.

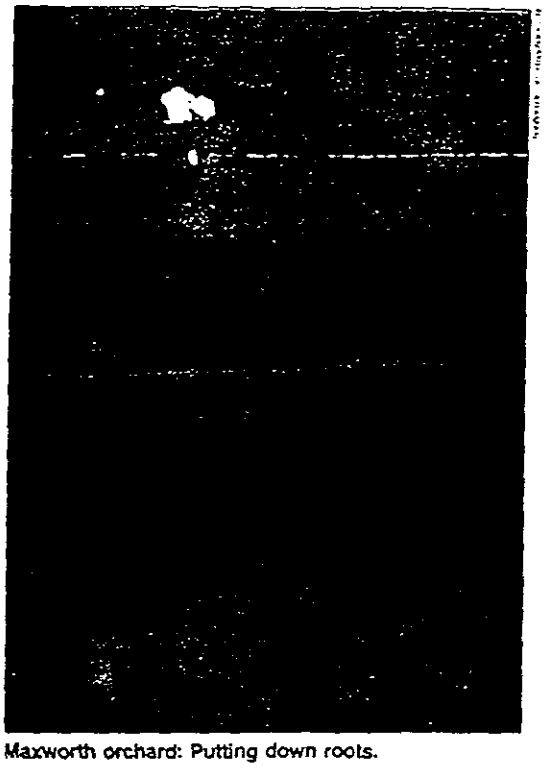
Maxworth's vice-president of horticulture, I. Irlappan, says the vegetables will grow faster than the fruit trees — providing export earnings while investors sit out the 45 months it will take their investment to bear fruit. (Guavas, pomegranates, tamarinds and brown, grainy sapotas, that is.)

Since Maxworth Orchards started in March 1993, roughly 5,000 urban professionals have given into their bucolic fantasies — and pursuit of tax shelters — and taken the company at its word. At 45 sites found by Maxworth, the investors have bought 4,350 acres (1,740 hectares) of fallow land in quarter-, half- and one-acre lots. At an average 20,000 rupees ($625) an acre, the land has been marked up four or five times, Maxworth acknowledges.

Once all the lots at a site are bought, Maxworth joins them up and plants orchards there on behalf of the landowners. In so doing, it's reaping a small change in the Indian style of agriculture. Big orchards can be farmed more efficiently than small ones, says Maxworth President Debabrata Haldar; yet much of Indian farming is hobbled by independence-era laws that limit land ownership to 50 acres. It's also bringing new money into a traditional industry, using the lure that agricultural income is tax-free.

Indeed, Maxworth is but one of many Indian companies that in the last five years have promoted unit schemes in horticulture and animal husbandry. For example, there's Goats India, in which investors don't own the goats but get returns annually. Moolchand Exporters of Madras sells cashews this way, too.

And then there are 150 or so teak plantations offering similar investments. They are popular even though investors who buy saplings are not promised a single rupee for 20 years. Sterling Holiday Resorts, run by the same people who run Maxworth, already has a teak plantation,



Maxworth orchard: Putting down roots.

Sterling Tree Magnum. So does Anubhav Green Farms & Resorts, which also runs 170 acres of investment orchards. Maxworth, meanwhile, plans to expand into orchids and cut flowers, says Irlappan, the company vice-president.

The orchard schemes are different from those involving cashews and goats because investors own their investment. But while they provide a way around India's restrictive land laws — enacted half a century ago to end a feudal agricultural system — how do they fare as investments?

Maxworth's promo kit tells investors they won't see any return until 1996. But at that time, the money they planted will come back tax-free. Maxworth promises 30% returns at first, "going up to over 100% from the twelfth year, every year."

The fine print says the returns will be a more modest 15-20% at first. And if they are higher than Maxworth's graded scale, the company pockets the difference.

The promise is firm enough for investor P.R. Sathappan, though. "Chances of losing are very low . . . If after three years there's anything wrong, I'll take my land," the Madras businessman says. Sathappan says he was sceptical about the scheme at first, but bought eight acres.

Sathappan says the strong performance since [illegible] of Maxworth's sister company, Sterling Holiday Resorts, helped convince him to buy the plots. The Maxworth scheme was conceived by R. Subramaniam, the businessman who also set up Sterling.

The fact that Subramaniam and other Maxworth principals hold 75% of the company's stock, and therefore have their own money at stake, also encourages analyst Umesh Desai of Calcutta-based CD Capital Markets. Maxworth went public in Bombay in September at 35 rupees a share; its price has since stabilized at 65 rupees.

Others are also positive. Madan Chand Darda, chairman of Madras brokerage Madan & Co. says of Maxworth: "Earnings-wise they're fantastic." Madan says he bought 20,000 shares of the company.

Maxworth expects its earnings per share to reach 20 rupees by 1997, up from 7 rupees now. It says it has already made 128 million rupees on sales of land and vegetables.

Whether or not its investment concept hits pay dirt, the company is able to mobilize the kind of cash many farmers can only dream about. Half of India's land holdings are 2.25 acres or smaller. And although the country is the world's second-largest producer of fruits and vegetables, its farm yields are far below those of developed nations. Because Indian farms are so small, most are simply rain-fed. They cannot afford the irrigation pipes, wells, and fertilizer they need for Maxworth's style of intensive horticulture, says Irlappan.

The company secures 100-350 acres of contiguous lots and pays the owners 10% of their market price in order to keep them off the market. Then, with its staff of 650, not including the orchard labourers, Maxworth pulls together hundreds of investors to buy the lots. Most of Maxworth's orchards are in India's southern states of Andhra Pradesh and Tamil Nadu.

Maxworth officials say the farmers who own the land when the company approaches them aren't interested in the unit schemes themselves because they want quicker returns than the urban professionals.

But horticulturalist K. Sekar of the M.S. Swammathan Research Foundation suggests some farmers may be sceptical about Maxworth's methods — planting trees densely and intercropping: "The practice may be commercially sustainable. But what of the condition of the land after 40 years?" ■