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→ SUBJ : Timber Production Schemes

In response to your request for information on post-disaster timber reclamation and production schemes, and for an assessment of Sister Alicia's proposal entitled Hurricane Relief Timber Utilization Project, I am pleased to submit the following information in two parts:

Part No. 1 - General Comments on Post-Disaster Timber Production Schemes

Following almost every hurricane which strikes an area that is heavily forested, timber reclamation schemes are proposed. Unfortunately, very few have actually gone into effect and those that have have only met with marginal success. Before undertaking a project of this type, it is imperative to consider the problems, the economics and some of the common mistakes which have been made with this type of program.

A. Problems:

The two biggest problems to overcome in the actual reclamation of the wood are the quality of the wood and the location of the wood. In relation to the quality, three things must be considered:

- 1) The extent of deterioration to the wood during the time between the felling of the wood by the hurricane and the time that it can actually be reclaimed and processed. In drier forest areas such as the mountainous regions of Central America, where the predominant woods are pine and cypress, wood may last several months before serious deterioration takes place. In the tropical zones and jungle forests of the Caribbean islands, deterioration of the wood on the ground is much more rapid due to a combination of moisture and insects. Therefore, any timber reclamation scheme must get underway almost immediately following the hurricane. This is not to say that the core of the wood of large trunked trees may not still be good, but unless adequate timber can be salvaged from each tree trunk, a timber production scheme will not be successful due to large wastage caused by the necessity to "peel away" the rotten outer portions of each log.
- 2) Another consideration on the use of wood is the actual time that the tree was felled by the hurricane. It has been shown that in many tropical timbers the best time to cut the wood is during the period of the full moon. The reason for this is that the full moon tends to draw the saps of the tree upward and throughout the entire system. This not only aids in the curing process but also means that the wood will deteriorate evenly rather than having one portion deteriorate at a different rate than other pieces of the wood, and therefore the wood can attain uniform strength throughout the board. If the hurricane occurred at a time when the moon was at its dark phase the quality of the timber will be of a much poorer standard than would be the case if the hurricane knocked the trees over during the full moon period.
- 3) When large numbers of trees have been knocked over in a haphazard manner by hurricanes it is often very difficult to assess the quality of the wood and the amount of boards that can be taken from the damaged stand. It is therefore imperative to conduct a fairly pessimistic survey before determining whether or not to go ahead with a ~~natural~~ production scheme.

A second set of problems occur relating to the actual location of the timber which has been felled by the hurricane. Often ^{the} wood which is in the greatest quantities is unfortunately felled in areas which are inaccessible or which will require extensive sophisticated equipment ~~in order~~ to retrieve the trees that are down. Adding to the problem is the fact that the hurricane often tangles the wood and stacks it haphazardly in the forest. In normal timber operations the wood is carefully cut so that it falls in a direction which will allow the lumberjacks to easily extract the wood from where it has fallen. That easy access and extraction are key economic issues to be considered can be found in the controversial process of clear cutting which is now hotly debated within the United States.

B. Economics:

If it can be determined that sufficient quantities of wood can be easily reclaimed, a complete cost analysis must be run to determine the economic viability of the project. In general, there are four factors to be considered:

- 1) ^{The} minimum amount of wood which can be salvaged per tree for the project to be economically viable must be determined.
- 2) The amount of wood salvaged in relation to the man-hours required to salvage the minimum amount must be determined.
- 3) The amount of wood salvaged in relation to the capital investment must be determined and related to the total investment in man hours required to produce the minimum amount per tree.
- 4) An accurate estimate of the time lost due to equipment, weather and transport delays must be figured in into the project.

From these figures, an estimate of the cost per board foot can be determined and when compared to the cost of timber which is commercially available and which in reality is the price to beat, the overall viability of the project can be determined.

C. Common Mistakes In Setting Up Small Timber Reclamation Programs:

In reviewing the general experience in setting up post-disaster timber reclamation projects, a number of common mistakes have surfaced. These are:

- 1) Improper budgeting: The most common budgetary mistakes are over-estimating the amount of wood that can be economically produced from felled trees and failure to calculate the amount of man-time necessary to prepare the logs on site in order to ~~remove~~ ^{place} them to a ~~part~~ where they can be properly milled.
- 2) Improper Equipment Selection: Most small timber production schemes are based upon the idea of using portable light-weight equipment to produce large quantities of milled timber. The problem is that the equipment that is often chosen has been designed for light use as back-up machinery to be used in extraordinary situations or for back-up equipment when larger permanent equipment is down for maintenance. If any timber production scheme is to be viable, a suitable investment must be made in obtaining first class equipment. Portable sawmills, no matter what the manufacturer claims, are simply not designed for heavy duty use. The amount of time lost due to equipment maintenance and repairs as well as the difficulty in obtaining necessary parts quickly, and often the added problem of obtaining qualified personnel to carry out the maintenance on the equipment often jeopardize the production scheme shortly after it goes into operation. If the intention is for a sawmill to stay in

production only for a few months then a portable equipment can be justified as long as the timber can still be produced at a competitive price, factoring in the initial cost of the sawmill.

- 3) **Failure to Accurately Estimate the Market:** This point cannot be overstated. Before initiating a timber production scheme, an accurate estimate must be made as to whether or not the timber produced can compete with the timber which is already on the market. Factors to be considered and evaluated include not only the comparative price but also the quality of the wood and whether or not the wood being offered in the normal market is treated and cured in the same manner. A number of timber production schemes carried on in the Far East could produce wood at a cheaper price per board foot, but due to the lack of wood treatment facilities, wood was not competitive on the market with wood which was imported from another location due to the fact that without proper wood treatment the wood would deteriorate and have a life-span of only one-third of that of wood at a slightly higher price. In assessing whether or not the wood can be offered at a competitive price, the lowest possible price that the wood currently on the market could be offered for must be determined. Many wood production schemes have commenced with only a small margin of profit only to find that the wood on the existing market was over-priced and could be dropped below the production price being offered by the wood reclamation scheme. This should be a special consideration where a local government offers wood at subsidized prices or where protective trade barriers do not exist.
- 4) **Failure to Estimate Equipment Relocation Costs:** When using portable sawmills which must be relocated to the areas where the timber is down, an accurate assessment of the time lost due to moving the facilities must be made. Most of the portable mills on the commercial market require approximately four hours to take down and set up. Added to this, any time required to move the equipment between sites and as much as one and a half working days can be lost simply due to the relocation of the equipment. This down time must be factored in to the economic considerations.
- 5) **Attempting to Salvage in Difficult Terrain:** Too often post-disaster timber reclamation projects attempt to reclaim timber in land which is virtually inaccessible. ~~The only place where small reclamation projects should be undertaken is on flat, easily accessible terrain served by adequate feeder roads.~~
- 6) **Failure to Establish Timber Ownership Rights:** Incredible as it may seem, many timber production schemes are often launched without clearly defining who has the right to the final product. Before initiating any scheme, a legal contract must be developed guaranteeing the timber producers the right to access on the land where the timber lays, establishing the right of ownership for the logs to be processed and establishing the right of ownership for the final product produced by the mills.
- 7) **Failure to Anticipate Clean-up Costs:** The production of timber means that there will be timber wastes. Not only are large amounts of wood cut from the main trunks which cannot be used later, but also large piles of sawdust, bark and shavings are left over in the processing of each log. The clean-up costs for this material can be high, unless adequate plans are developed in advance to use the by-products. For example, charcoal can often be made with the timber shavings and branches which are cut from the main trunk. The sawdust is much more difficult to get rid of.

D. Summary:

While the objectives of salvaging the timber which has been destroyed by a hurricane are certainly laudable, the problems which must be overcome for such a production

scheme to be economically viable often make such a project unrealistic. Of four areas where schemes such as this have been proposed, only one, in Shrilanka, has been successful. The project in Shrilanka was successful because established timber production organizations immediately moved into the area with their equipment and began salvage operations within a week after the timber had been felled. The primary lesson to be noted is that a timber production scheme must be a viable scheme during normal times and should not be instituted solely on the basis of an opportunity provided by a disaster. If the project would not be viable in normal times, it would not be viable in a post-disaster situation. If the logging equipment and the expertise is on hand at the time of the disaster or immediately thereafter, a project which is simply an expansion of an existing logging operation can be considered.

Part No. 2 - Assessment of the Hurricane Relief Timber Utilization Project

The following assessment is based on a review of the proposal submitted by the potential project holders and is not based on a visit to the sites where timber production is to be attempted. Some of the written background material as well as discussion with forestry personnel in Dominica are also reflected in the comments submitted below. The review of this project has been undertaken from only the technical and budgetary aspects of the program.

- 1) The technical aspects of the project do not appear to have been completely worked out and may be overly optimistic.
- 2) A market entry strategy and a comparison with competitive prices should be developed.
- 3) The actual budget items presented should be worked out in more detail in order to give a clearer picture of the actual production costs involved.
- 4) The amount of money budgeted for replacement parts for the sawmill is only 10% of the total cost of the mill itself. A more realistic estimate of the replacement parts and spares would be between 25 and 50%.
- 5) The actual organization of the man power on site is not clear and appears to be inefficient given the amount of timber to be produced.
- 6) No mention is made of the facilities or allowances for the curing of the timber once it has been cut; how and where will this be carried out and what methods will be taken to protect the wood during this period?

To summarize, it appears to me that the project in question has only a limited chance of success as it has been delineated in the project proposal. Success in the project depends on a good market price for the wood being produced, the ability to keep production moving at a fairly steady rate without interruption or excessive down time caused by maintenance or equipment problems, and a very close watch on the labor inputs into the project. If the project is approved, I would recommend developing a strategy to increase production by increased utilization of the sawmill itself. One such strategy would be the acceptance of prepared rough-cut timbers for processing by the mill. Under such a scheme, people in the surrounding area could cut timber into manageable proportions, shave the outer edges away with hand saws, and bring the rough-cut timber to the mill for processing into boards. The mill could either purchase the prepared logs and then add the boards to its own stock or it could charge a fee for processing the wood for those bringing the wood to the mill.

It is my hope that these comments will be helpful in assessing the project before you now. If you have any further questions, please do not hesitate to call my office. An additional source of information on timber production is the Forest Products Laboratory located in Madison, Wis., operated by the U.S. Forest Service, and the Tropical Products

Research Station in the U.K., which can be reached through the British Development Division in Barbados.

Respectfully submitted,

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