

ABSTRACT

Natural Succession and Rehabilitation of Derelict Land at Abandoned Quarry Sites

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The process of recolonization of derelict land by plant species at abandoned quarry sites in Trinidad was monitored over six years at sites located at San Fernando Hill, Tapaná and Arima Valley, which represented three distinct soil types. Duplicate plots (A and B) were used for experiments at the first two sites, while the Arima Valley site was used as a reference site.

Natural succession was monitored at Plot A to discern the patterns of colonization and community structure as well as to shortlist plants which facilitated the amelioration of environmental stresses at each site (facilitators).

Seven plant species which are used in the Forestry Division's rehabilitation programme were planted on Plot B at San Fernando Hill and Tapaná and monitored for one year. There was a very high mortality rate among the seedlings of all species, except those of Acacia mangium. The ability of this species, and others chosen from the natural succession data, to accelerate the rate of recolonization of derelict land, was evaluated by monitoring the effect of these species on the recolonization of Plot B in comparison with the unaided natural succession at Plot A, using univariate, distributional and multivariate analyses.

The presence of these 'facilitator species' in Plot B at both sites reduced surface soil temperatures and increased soil macronutrient

concentrations, and resulted in a 100% increase in plant populations in Plot B compared with Plot A. The patterns of community structure however did not differ between the plots suggesting that the effect of the facilitators on plant abundances resulted from the reduction in environmental stress rather than through a change in the pattern of succession.

It is suggested that these facilitator species may be used in the first stage of sustainable rehabilitation of derelict land, and that stress intolerant forest species could be planted in subsequent stages to continue ecosystem development.

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