

## FACTORS INFLUENCING SUCCESS IN SENEGAL'S VILLAGE-BASED TREE NURSERIES

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### INTRODUCTION

In land-scarce environments such as Senegal, social forestry holds great promise for improving and sustaining the productivity of lands under cultivation, but must overcome obstacles to adoption and create incentives to encourage farmers to adopt these practices.

One key to encouraging tree planting efforts has been the establishment of a highly decentralised nursery and seedling distribution system funded by internationally and locally funded reforestation projects. At the centre of such a system is the village nursery where villagers grow seedlings to supplement or replace those supplied by government-owned regional nurseries.

The benefits of a village nursery can be viewed in social as well as economic terms. In many African villages, distinct social groups exist for economic and political decision making. Village nurseries can be managed by women's or men's groups or by individuals. Village nurseries provide lower labour and transportation costs and fewer mortality losses than government nurseries. Disadvantages of village nurseries can include poor quality control, unpredictable production, lack of access to expertise, and insufficient water sources.

The effectiveness of village nursery programmes depends on the villagers' willingness to establish and continue a network of nurseries. To ensure success it is vital to help change agents create local support for each nursery. A year or two of poor survival may result in disinterest by villagers and perhaps permanent abandonment. Even if the nursery is initially successful, sustaining it is not a certain proposition, and the factors influencing discontinuance of agricultural and forestry practices are not nearly as well understood as those affecting the initial adoption.

In Senegal, there are approximately 690 village nurseries in 10 regions, 461 of which were established under 16 reforestation projects (Division de Conservation de Sol et Reboisement, DCSR, 1988). We selected eight villages in each of four projects (32 total).

## **OBJECTIVES**

The objectives of this study were:

- 1) to investigate determinants of success in village nurseries in terms of
  - a) seedling survival at the end of the nursery season;
  - b) manager's intentions to continue;
- 2) to understand how future programmes for implementation of village nurseries could be improved.

Seedling survival rate was used as one indicator of success. We hypothesised that survival can be influenced by village knowledge, physical/environmental conditions, competition from other agricultural activities, and cultural barriers. Survival rate is important because reforestation efforts depend on a crop of healthy seedling outplantings.

Intention to continue was chosen as an indicator of programme self-sustenance. Response was limited to plans for next year and was divided into conditions of with and without continued financial incentives. Some projects provide seeds, pots, a water well, or other forms of financial supplement. The intention attitude was assumed to be prerequisite for actual continuation. Despite the well-noted methodological discrepancies between attitude (intention) and behaviour, we treated positive intention as a necessary, if not sufficient condition for actual continuance of nursery practice. Follow-up studies would confirm whether these villagers act on the intentions expressed.

## **ANALYSIS OF THE RESULTS: DISCUSSION**

### **Seedling survival**

Participation by the village in planning the nursery was revealed as an important determinant of seedling survival despite the fact that many other potentially important factors could not be measured, such as interest and activity load of the extension agent, political problems within the village, and pest losses.

The results reinforce the concept that the adoptability of social forestry depends on accurately and obviously reflecting the needs, aspirations and problems of the people, and is best implemented through open consultation with the people from early in the process. When villagers perceive ownership in the conception of projects, and ultimately the benefits, they better care for the nursery, and the biological success is higher. Species selection in this case related more to end uses than to biological suitability to nursery conditions.

### **Intention to continue**

Financial incentives had a significant impact on the nursery managers' intentions. The one-year discontinuance rate would at least triple without financial incentives. Most of this was due to the lack of money to buy seedlings and to repair wells, and part was due to the perception that continued technical advice was less likely if there was no investment by the project. This raises a question about whether self-sustained production is possible. Even with continued financial incentives, about 25% of the villages did not plan to continue the next year. This was a substantial rate of abandonment that would severely reduce the number of nurseries after several years. Some of the reasons for not continuing were: lack of adequate water supply, lack of sufficient labour, and disinterest due to poor seedling survival.

Without financial incentives, continuance was most positively correlated with the previous experience of the nursery managers. This suggests that villagers who had helped establish nurseries in the past, with other projects or on their own, should be targeted for sustained adoption.

Since villages without water supply problems are more likely to continue, projects should concentrate financial incentives and technical assistance on securing a permanent water source. The provision of a water supply may be more important than the supplies and equipment normally provided.

Villagers who had sold seedlings from their nursery, in this sample, were more likely to continue. This supports Anderson's (1987) idea that charging for seedlings to cover operating costs would maintain nursery viability and discourage wasteful practices. There is evidence that the demand for seedlings among villagers and the availability of currency or in-kind barter is large enough to support more nurseries. Marketing systems and business practices are not usually covered, however, in the training provided to the villages by project personnel. Markets for trees and tree products from the village woodlots would also encourage greater seedling demand, but market development was not an important facet of any of the four projects we studied.

## **CONCLUSIONS AND RECOMMENDATIONS**

Our results reinforce other studies that suggest that villager input in fitting the innovation to local needs positively influences how well and how completely it will be adopted. We feel that this begins with the amount of care villagers put into tending practices and carries over into attitudes for sustaining the innovation.

Our study showed us several ways to maximise nursery project success (continuance) when projects are selecting new villages, for example, it would be beneficial to start with those individuals with previous nursery experience. Because villages with ample water were more likely to continue, projects could allocate resources to maintain water sources. Finally, seedling sales could be promoted by projects by providing marketing education along with nursery techniques training. Any project redesign should be based on a thorough evaluation of these and other factors.

## **FURTHER RESEARCH**

Further research is needed to correlate villager characteristics and elements of village social structure with nursery continuance. Research is also needed on the impact of economic incentives including:

- costs and benefits of direct incentives such as wells;
- seedling market potentials in rural communities;
- procedures for efficiently marketing seedlings.

It appears that the marketing of seedlings could engender further commitment on the part of villages selling the seedlings, purchasing the seedlings, and could also promote inter-village trade.

Village nurseries in Senegal offer an alternative to government seedling production. The key to successful establishment and continuation lies with the creative blend of extension methods, incentives, technical assistance and organisation. By combining the current village-based nursery practices and the key success factors studied here, forestry extension programmes could create even more positive changes in the attitudes and behaviours in reforestation practices of villagers in rural Senegal.

## **BIBLIOGRAPHY**

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