Quality Deterioration and the Role of Rehabilitation of Cocoa Production Chain in Nigeria

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Summary

The goal of obtaining good income for cocoa cultivation is intrinsically connected to the sustainability of this sector. This on the other hand cannot be realized without a well – laid out plan to attain quality in all various management aspects in the long cocoa production chain. Over 90% of Nigeria – cocoa farmers do not have a good understanding of the production chain which is the major cause of poor quality in cocoa production in Nigeria. This may lead to some problem for the customers of cocoa farmers, to minimize these problems and to improve their cocoa, we need to look at the entire chain of cocoa production, from the farm level to the processing level. This study evaluated the effect of rehabilitation of cocoa production chain on the quality of cocoa in Nigeria.

Methods and Material

1. Adoption of good management practices by farmers and efficient management of biophysical resources through appropriate selection of the best cocoa variety that the farmers can cope with. The management of the cocoa variety for the farmer is very important because the Kakona variety bears more fruit than any other variety. Hence, the Kakona variety was selected for the study.
2. Selection of appropriate soil nutrients through the use of soil tests, for the farmers. The use of soil tests is essential to ascertain that the farmers are aware of the soil nutrients that they require for the production of better cocoa.
3. Selection of appropriate harvesting method by the farmers. The use of appropriate harvesting method is very important in reducing the quality of cocoa. The farmers were trained in the use of appropriate harvesting method.

Results

Certain primary activities can be identified in the production chain as contributing to overall quality of production (Figure 1). These activities could be used as control instruments in the planning of efficient management on cocoa farms.

Figure 3 indicates the potential of each activity on quality “deterioration”. A discussion of each of those factors follows:

Seed Choice

All cultivated cocoa is classified into a single species, Theobroma cacao. The three main recognized groups are Trinitario and Tinto. The West Africa Amelonado (“Lower Amazonian”) cultivated in Nigeria belongs to the Forastero group, despite the relatively bitter and often acrid taste of the processed beans, its high level of homogeneity is much appreciated. Generally speaking, F3-Amelonado belonging to the “Upper Amazonians” was successfully introduced into Nigeria about 1950 and is found to be superior to Amelonado in establishment, vegetative vigour, yield, etc. The processed product of the criollo types have a fine aroma and only a slightly bitter taste, thanks to its low tannin content. It is used for fancy chocolate products however they are not as productive, grow slowly and are less hardy than Amelonado. The Trinitario groups consist of hybrid populations of very after abundant crosses between the Arabica and the Forastero varieties and is responsible for many of the new cocoa varieties.

Nursery and Transplanting

A nursery is here defined as an intensive plant–care centre. The intensive care practices start with the original selection of recommended or approved planting materials. Cocoa produces receptive and generally vigorous seeds. They are wet and normally lose viability rapidly even within 2 years. The propagation therefore depends heavily on the operation of very good nurseries and nursery practices. The leafless cocoa seedling start long before the field operations are set in motion. The selected nursery site must be flat and well drained to prevent surface erosion and seasonal waterlogging. This site is cleared, levelled and beds 15.25m × 1.82m × 10cm high are prepared across the slopes. Artificial shade, which can be provided either by the use of water tanks or coconut leaves, fencing, climbing plants, or shade trees, is very important to avoid any source of contamination during storage. Beans should therefore not be pulled (or tear) off cocoa pods by hand. A smooth object, preferably a cushion, should be used to avoid injury to the beans and thus creating access for infections. The cocoa could be sold to buyers or export firms as soon as possible. There is no advantage in keeping cocoa in the house where it is liable to deterioration in quality. This practice by processors should be discouraged. The estimated contribution of bagging and storage practices to quality decline in the cocoa production chain is about 15%.

Bagging and Storage

The purpose of drying is to lower the moisture content of the fermented beans from about 60% to less than 8%, in order to inactivate enzymatic reactions and preserve the processed cocoa. Sun drying on concrete slabs is still the most economic and practised method during the dry season. The size of the slabs depends on the production capacity of the cocoa farmer and is usually supplemented with tarpaulin, which is used to protect the cocoa at night, especially from dew and attacks by catterpillars. In the rainy season the tarpaulin is also essential to keep rain away from cocoa being dried on concrete slabs. The beans are stirred regularly, particularly during the initial stages of drying so that water can evaporate and dry mudsludge detach itself from the beans, which become clean and shiny. The duration of sun-drying varies from 8 to 15 days, depending on weather conditions. Well-dried beans will crack when squeezed between the first and second fingers. Once it passes through a knife, the cotyledons separate easily. The primary processing of the cocoa is the most critical activity in terms of contribution to quality decline, which is put at about 17%.

Harvesting

Seasonal fluctuations occur, sustained by a clearly differentiated wet and dry season, although cocoa fruits all the year round. A peak production is observed during the period with least rainfall. The main October–November harvest (20%) of total production begins in the middle or towards the end of the rainy season and continues until the middle of the dry season (December to mid-January). The smaller harvest (20% of total production) takes place in the period April–June. The harvesting of the pods, which is done at regular intervals of 10 to 15 days, commences when the pods have completely ripened. Green pods turn yellow when maturing while maintaining a light green colour at the base. It is at this point that the aqueous sweet mucilage, essential to successful fermentation of the beans is most developed to produce beans of best quality. Over-ripe and under-ripe pods produce beans of low quality. During periods of low yield, less frequent harvesting can be practised. The podding of the pod is cut with a sharp blade (harvesting hook or a sharp cutlass), attention being paid not to damage the flower cushion in which the pod is developing. Damaged pods, which are eventually aborted, may comprise future productivity. A little stub should therefore always be left behind after cutting off the pod. De-sheating or insect infestation among the sheath covering the ripe fruit causes bruising. The ripened pod is then carefully broken open (i) using a knife or (ii) into smaller pieces using any hard implement. The empty pod is then discarded. The beans are then removed and destalked by manual sorting. The mature cocoa fruit is opened to extract the beans. A smooth object, preferably a cushion, should be used to avoid injury to the beans and thus creating access for infections. Pods should not be kept for more than 2 days before breaking as longer periods affect the quality of the beans. The extent of cracking is important as it may compromise future productivity. The contribution of bad harvesting practices to deterioration in quality in the cocoa production chain is about 15%.

Conclusion

Primary processing, harvesting, and seed choice are the first three activities with the highest percentage of contribution to cocoa quality. Restoration of cocoa yield to its peak level is possible by systematic replacement of inferior trees. We recommend a viable, well – informed and well – equipped extension services that will enhance the practice of good husbandry, especially among the smallholder cocoa farmers.