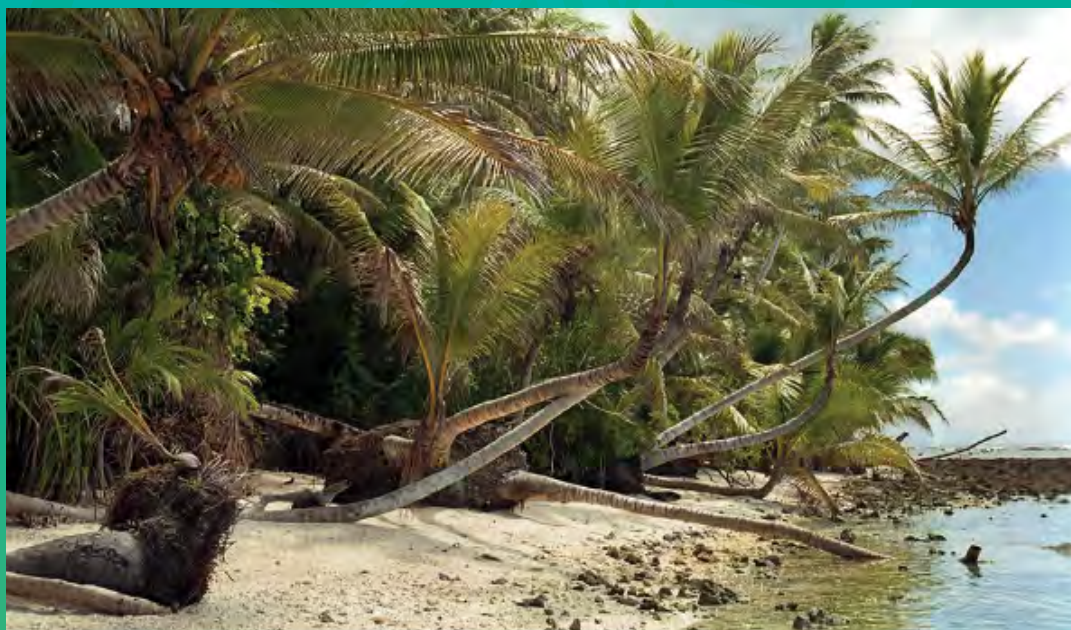




Pacific
Community
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Coconut Risk Management and Mitigation Manual for the Pacific Region



Compiled by R. Bourdeix, J. M. Sourisseau and J. Lin

Suva, December, 2021



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Original text: English

Pacific Community Cataloguing-in-publication data

Bourdeix, R. (Roland)

Coconut risk management and mitigation manual for the Pacific region / compiled by R. Bourdeix, J. M. Sourisseau and J. Lin

1. Coconut – Oceania.
2. Coconut – Oceania – Handbooks, manuals, etc.
3. Coconut – Management – Oceania.
4. Coconut industry – Oceania.
5. Coconut products – Oceania.

I. Bourdeix, R. (Roland) II. Sourisseau, J. M. III. Lin, J. IV. Title V. Pacific Community

634.6170995

AACR2

ISBN: 978-982-00-1429-9

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To cite this manual:

Bourdeix, R., Sourisseau, J. M., & Lin, J. (Eds.). (2021). Coconut Risk Management and Mitigation Manual for the Pacific Region. Land Resources Division, SPC.

To cite a chapter of this manual:

Lin, J., Alasia, J. P., & Helsen, J. (2021). Risks linked to organizational and policy issues. In R. Bourdeix, J. M. Sourisseau & J. Lin, J. (Eds.). *Coconut Risk Management and Mitigation Manual for the Pacific Region* (pp 99-100). Land Resources Division, SPC.

Coconut Risk Management and Mitigation Manual for the Pacific Region

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27. HARVEST AND POST-HARVEST HANDLING

By R. Bourdeix, K. Bennett, and R. Goirand and U. Vave

Description

The risk is that a disruption of the timing of harvest or delivery of the crop, or a delay in processing the crop delivered to the factories, could result in poor quality and degraded products.

Occurrence and severity

Farmers often don't have efficient access to storage and transportation, which are indeed among the most strategic segments of every long export value chain.

The fragility of mature coconuts is often underestimated, especially when the husk has been removed. Coconut seems hard and resistant but under certain conditions, which remain to be fully specified, they can degrade quickly and lose their organoleptic qualities. On very tall coconut palms producing big fruits with a thin husk, the coconut shell could be damaged if the fruits fall on rocky soils. Such an example was found in the Marquesas Island, where the farmers failed in getting seednuts from a precious old palm producing enormous coconuts with thin husks: all broke in falling.

This appearance of solidity makes visual assessment of the conservation status difficult. Sometimes a nut looks outwardly perfectly healthy but is rotten inside. This happened recently to an African exporter. After five years of activities without problem, he had negative responses from his customers indicating that part of the mature coconuts had a very bad smell due to internal mould between shell and kernel. Analysis showed that this came from: 1) harvest of immature coconut; 2) micro cracks caused by coconut falling from tall palms to the ground; 3) humidity and hot storage temperature increased internal mould risks.

If transportation is delayed, or storage at farm level is too long and in inadequate conditions, the impact on quality is getting more and more important, with bigger consequences on price and income. It may be a real difficulty to reach the quality required for export standards. In some cases, during the high harvest season, long line queueing occurs in coconut processing factories. Coconuts can be stuck beside the factory for 2-3 days which can make coconuts rot, or cracked on the truck, the water inside the coconut is wasted and may lead to huge losses.

Mitigation and adaptation

For this risk, mitigation strategies are to improve the practices in harvesting at farm level, and/or to improve the storage method, and/or to reduce the duration of transportation and/or to improve transportation conditions, so that the products do not degrade.

Internal procedure control helps to assess risks. For instance, for mature coconuts, sampling and cracking coconuts are conducted on a statistical basis with farm traceability. This will validate the satisfactory quality of coconuts before final sorting and packing for exportation.

This post harvesting procedure needs to be preceded by controls involving the farmers themselves: avoiding immature and over mature fruits; before dehusking, avoiding direct contact between coconut and the ground, avoiding large heaps of husked coconut under direct sunlight. The ideal would be to harvest without coconuts falling from the tree (coconut

bunches must be tied with a rope) but this adds extra cost, and this is not in farmers' habits.

In India, farmers often store coconuts under their roofs; these nuts dry until losing all their free water without germinating or rotting. The kernel retracts and detaches from the shell. It ends up forming what Indian farmers call 'ball copra', a kind of almond egg naturally dehydrated and considered as a delicacy. The same phenomenon occurs sometimes when the fruits remain hooked without falling on the coconut trees. When you shake these nuts, you cannot hear the sound of water, but the dry crackling of the almond egg that hits the shell.

Actions to undertake

Popularize and disseminate the techniques for 'white copra' proposed by Marisco (APCC Cocotech). Such white copra has a higher selling price and can be conserved longer.

Actions are first regarding extension services on harvest, storage and transportation good practices. Advice should be delivered on how to plan an adequate storage unit by production area, avoiding mixing good and bad quality copra in the storage facilities. Advice should also concern the right moment to transport the nuts and the way to do so (packaging, control of the heat, precaution when handling, etc.).

Actions to undertake can include improved collective action. Improving collaboration among farmers, private industry, and government may help to facilitate transportation and globally reduce the time between harvest and arrival to the place of first transformation.

Another set of actions concern improvement of farms and factories or intermediary equipment. Depending on the quantity of product along each different step in value chain, it may be relevant to give incentives to farmers, or to other stakeholders, to improve the storage and the transportation conditions. Dedicated loans, with subsidized rates can be decided, or direct grants for facilitating investment. These strategic elements should get more attention from policy makers and development operators.

References

- Grimwood, B. E., & Ashman, F. (1979). *Coconut palm products: Their processing in developing countries* (No. 99). .]. FAO agricultural development paper; no. 99. Food and Agriculture Organization.
- Guarte, R. C., Mühlbauer, W., & Kellert, M. (1996). Drying characteristics of copra and quality of copra and coconut oil. *Postharvest Biology and Technology*, 9(3), 361-372.