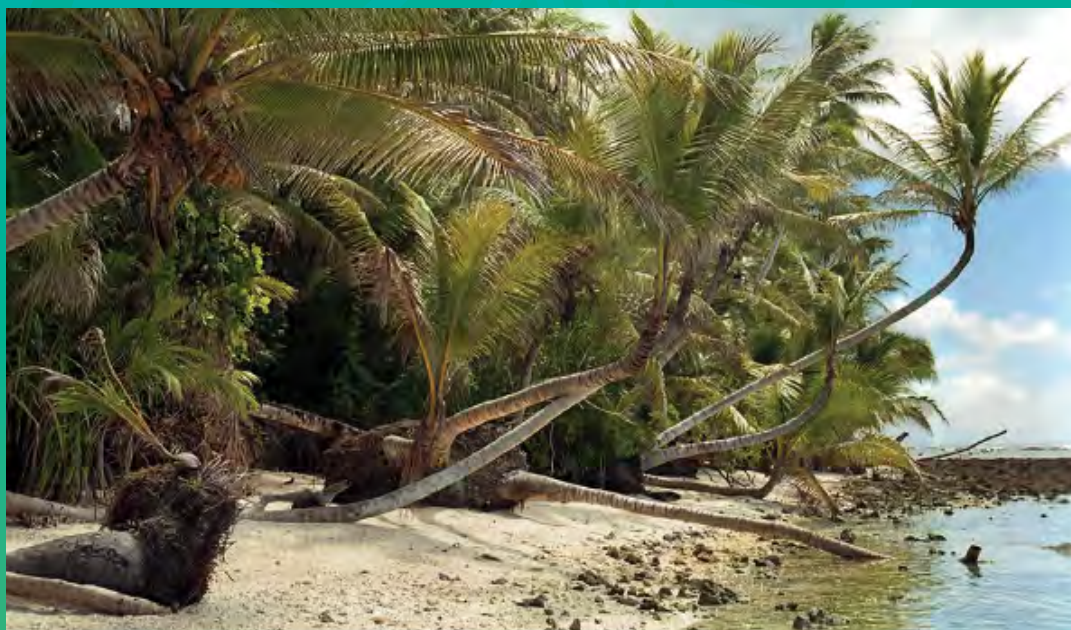




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Coconut Risk Management and Mitigation Manual for the Pacific Region



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

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Coconut Risk Management and Mitigation Manual for the Pacific Region

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C. ABOUT THE NOTIONS OF RISK AND RISK ANALYSIS

By J. M. Sourisseau and R. Bourdeix

Conceptually speaking, the notion of risk is based on an unrealized event with a non-zero probability of happening and negatively impacting the activities. A risk becomes proven when it has negatively impacted activities at least once. The negative character of an event, as well as the concept of hazard, depends on cultural habits: risk is in that sense a social and individual construct. This study concerns many island states with very diverse status, and a long tradition in coconut production, where some events or situations have already occurred, with negative impacts on the coconut sector. Therefore, as in many cases of risks analysis in agriculture, we will also consider events already experienced.

Risk results from the combination of four elements of a different nature: a *danger*, its *probability*, its *gravity* and its *acceptability* (Jacquot, 2010).

The word 'risk' belongs to the vocabulary of everyday life: 'who risks nothing will have nothing'. Most risks result from a possible change in the environment or our relations with it, which makes inadequate the strategies developed to reach our objectives, or even which puts these objectives out of reach. Since 1921, researchers have distinguished two situations that apply when the future is risky or haphazard: 1) it is possible to calculate or estimate the probability of a negative event occurring, and 2) it is not possible to estimate such probability. In the second case, the stakeholder has to face uncertainty.

These first definitions and warnings suggest adaptations to the agricultural sector. According to Cordier et. al. (2008), there are currently five categories of risk for the farm business, ranked according to the origin of hazards:

1. Climate and plant health risk affects agricultural yield and product quality;
2. Market risk related to price fluctuations of finished products and those of inputs;
3. Institutional risk generated by policy or regulatory changes that affect agriculture;
4. Financial risk related to changes in interest rates and exchange rates that also includes the risk of non-payment and liquidity risk;
5. Human health (sickness, death) and occupational (theft, degradation, destruction of production tools), common to all economic activities.

The specific consequences of risks to the farm business are based on the four essential and interconnected variables of agriculture performances: 1) market value of the production (sales revenue); 2) agricultural yield (quantity produced); 3) the quality produced and; 4) the cost of production. The farmer seeks to manage these variables for the intermediate purpose of

controlling the turnover and margin generated by agricultural production. Depending on their integration to market, the farmer's ultimate goals are to feed the family (and beyond the community), and/or to generate a positive economic income from their professional activity.

Farmers' responses depend on how they perceive risks. A few simple characteristics allow classification of agricultural risks:

- The origin of the risk: spontaneous (natural) or induced by people;
- Frequency of appearance;
- Intensity, which is reflected in the magnitude of the damage it causes;
- Type of prevention possible: some risks can be eliminated or mitigated, others can be avoided (or circumvented), others we can only adapt to (or prepare for);
- Level at which an action can be organized: distinguishing the risks that call for a response at the farm level, from those that require the establishment of a collective struggle system.

For managing its plantations, the farmer makes two types of decisions: strategic decisions and tactical decisions. The strategic decisions concern the organization of the plantation, the distribution of species and cultivation systems on and possibly between plots, the choice of varieties, how the crops will be transported and sold, all this to achieve an economic objective. The farmer makes these strategic decisions based on their accumulated experience, those of the relatives, and the available technical information.

During the growing and fruiting period, the farmer reasons tactical decisions based on changes, accidents, opportunities and agricultural work progress. They can, for example, respond to a specific drought by irrigating, respond to parasite attacks by phytosanitary treatments or biological control, or even market fresh nuts instead of mature nuts, because this market has become more profitable.

Some of the risks initially seen as relevant were finally removed from the analysis. Even if some phenomena strongly jeopardize the coconut sector, they cannot be considered risks because they already occur in most situations. For instance, a significant constraint is the low numbers, volume, and efficiency of coconut breeding programs in the Pacific region; but this cannot be listed as a risk, as it is already occurring in most Pacific countries except perhaps Vanuatu and Fiji. The lack of sufficient and regular national funding of coconut research is another example of risk that was removed, as this situation occurs in many countries of the Pacific region.

Along the value chains, the same five categories of risks are still valid, even if climate and plant health risk relate much more to the production and some specific processing segment of the chain. By analogy to the finance and insurance sector, a risk can be independent or systemic. A systemic risk is defined as a risk that can affect many people simultaneously. A dynamic notion completes this definition, a systemic risk is therefore 'a trigger event, such as an economic shock or institutional failure, that causes a chain of bad economic consequences—sometimes referred to as a domino effect'. In agriculture, systemic risk concerns the three first categories of risk described above (climate and sanitary, institutional, and prices). In contrast, human and occupational risks are mostly independent, affecting only one farm.

Working on incentives and risk analysis are two complementary tasks. Indeed, if the risks linked to a value chain are well assessed and prioritized, it will help to identify the most efficient incentives to mitigate the most important risks.

Risk management may address both the limitation of the occurrence of the undesirable event (prevention), and the reparation of the consequences of the adverse unpredictable event. Prevention depends on the nature of the risk and may rely on a wide range of solutions including a combination of those. For example, financial policies can prevent price ruptures and protect the sellers, or chemical applications combined with adapted cultivation techniques can prevent parasite attacks. Still no prevention is available for an extreme climate event. Regarding reparation, insurance can *a priori* solve most of the bad consequences of an unexpected event. But the cost may be prohibitive for fixing a decent price to insurance.

Another challenge is to analyse the possible combination of risks of different nature. The explanation may be highly complex, and a generic and systematic formalization of such a combination is most of the time impossible. For this reason, insurance is hardly a solution for systemic risk related to a domino effect and when damages result from a combination of threats.

Along the value chain, the possibilities for prevention and reparation for the different stakeholders differ; the risk exposure is typically higher for producers because they have fewer options for both risk management types.

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