



THE SOCIAL COCOA -NOMICS

FARMERS' LIVELIHOOD RESPONSES TO COCOA POD BORER

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INTRODUCTION

This note is the third in a series addressing CPB and food security among cocoa smallholders. The second note focused on the impact of Cocoa Pod Borer (CPB) (*Conopomorpha cramerella*) on the livelihoods of smallholders in the study sites of East New Britain, the Autonomous Region of Bougainville and Milne Bay provinces. This note will outline how farmers responded to the rapid spread of CPB and the loss of their main income source. With the CPB incursion, farmers have been confronted with significant challenges to their cocoa-based livelihoods and their socio-cultural way of life. The adaptation decisions households have made are varied.

RESPONSES TO COCOA POD BORER

As outlined in Note 2, the CPB incursion in PNG caused major disruption to the livelihoods of cocoa farmers. In ENB and AroB, cocoa production dropped by more than 70% and there has been a massive fall in smallholder incomes. For most smallholders, the initial response to the CPB incursion was one of bewilderment and a sense of loss and vulnerability. Growers didn't understand why their cocoa beans were rotten and unsaleable, and they didn't know how to respond. The CPB moth is tiny, and hence there wasn't any observable change in pests in their blocks. It has long been known that prior to CPB, cocoa growers in PNG tolerated high rates of crop losses from pests and diseases and few practised pest and disease control measures (Ghodake *et al.*, 1995; Konam, 1999; Omuru *et al.*, 2001; Curry *et al.*, 2007). Prior to CPB, Curry *et al.*, (2007) reported that one-third of mature pods in smallholder cocoa plots on the Gazelle Peninsula were lost to pests and diseases, mainly Black Pod and Pod Rot. However, smallholders had never experienced the near total loss of crop they experienced with CPB.

With a dramatic loss of cocoa income, smallholders adopted an array of livelihood responses and adaptations, both in the period immediately following the CPB incursion and later. These responses can be placed in six main categories where significant change has occurred:

1. Cocoa farm management practices
2. Household expenditure patterns
3. Income activities
4. Land-use change
5. Kinship and community networks, and
6. Skills development.

Each is discussed below.

Change in cocoa farm management practices

Initially with so many growers not knowing how to control the pest and with their cocoa trees heavily infested with CPB, the immediate response by some cocoa households in AroB and ENB was to abandon, partially-abandon their cocoa holdings or continue to manage using old management practices (Figure 1). Why invest your house-

hold labour in an activity where there was no return? However, through time, as farmers recognised that CPB was an enduring problem and household incomes would remain low until cocoa production was restored, increasing numbers of farmers attempted to adapt to the new production environment required for cocoa by returning to cocoa production and attending training to manage CPB and replanting with

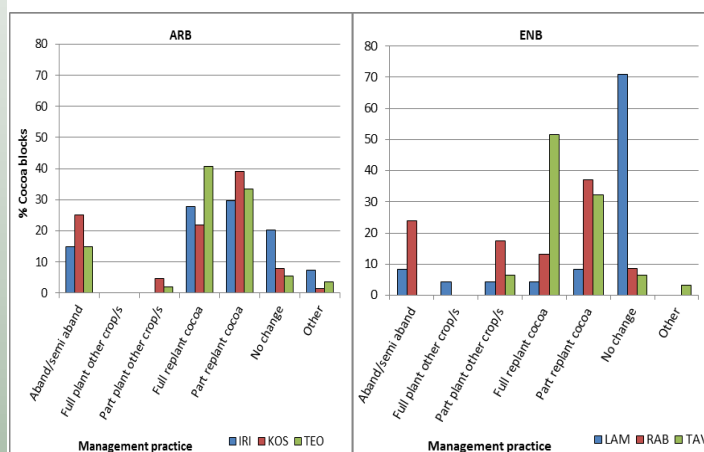


Figure 1: Block management since the incidence of CPB.

new cocoa varieties. On AroB the tendency was for farmers to fully or partially replant their cocoa blocks. Similarly, in ENB, at Rabagi and Tavilo, replanting became a common practice. Farmers who were more likely to fully or partially replant their blocks were those willing to apply new labour-intensive management practices and who previously relied on cocoa as their primary income source. They were also farmers who had access to CPB support programs including access to free cocoa seedlings, largely provided by the private sector. Farmers, at Lamarainam, where over 70% noted no change in management practices, were in fact continuing to struggle to contain CPB on existing cocoa trees. Thus, abandoned blocks, which were very common immediately after CPB arrived, have now been brought back into production as farmers replanted their cocoa blocks with new cocoa seedlings.

Household expenditure patterns

Another immediate response by cocoa households to the incursion of CPB was a sharp reduction in cash outlays. Consumption of store foods fell markedly with almost half (48%) of families on the Gazelle Peninsula reporting that they rarely purchased store foods (Curry *et al.*, 2009). Expenditure on health and education also decreased, despite education being highly valued in ENB and AroB. Families were also forced to reduce the amount of financial support given to the extended family to meet social and cultural obligations. In November 2008, only 17% of cocoa smallholders were still striving to meet these obligations while 61% claimed to have stopped supporting their extended families.

In 2014 the ramifications of CPB on household expenditure patterns for households remain evident. As highlighted in Note 2, many households continue to limit their contributions to customary obligations and there is insufficient income to save money. The loss of cash income, and savings has not only reduced household purchasing power, but also the quality of life associated with traditional cultural values and practices.

Income Activities

Prior to CPB, cocoa was the primary income source for smallholders in ENB and ARoB. With the abandonment of cocoa in the immediate period following the incursion of CPB, a noticeable response by smallholder



Women became more reliant on marketing as a primary source of income following the incursion of CPB.

Plate 1: Garden food crop sales

households, especially women, was the expansion of production of garden crops for home consumption and for sale at local markets. At all sites women focussed on the marketing of food as one of their primary sources of income (Table

1), with the exception of women at Tavilo who had received early support from the private sector to control CPB.

Table 1. Primary income sources for women “Just after” CPB and “Now” (% Households).

Period in relation to incidence of CPB	ARB			ENB		
	IRI	KOS	TEO	LAM	RAB	TAV
Just after	Mkt garden food crops (22%)	Mkt garden food crops (30%)	Mkt garden food crops (41%)	Mkt garden food crops (48%)	Mkt garden food crops (38%)	Cocoa (39%)
Now	Cocoa (53%)	Cocoa (53%)	Cocoa (59%)	Cocoa (52%)	Mkt garden food crops (55%)	Cocoa (61%)

For women, the scaling-up of food gardening was the preferred initial response because it was an activity they were familiar with and the marketing of fresh food had long been an important livelihood strategy for them. Women in ENB and ARoB were asked to identify their four most commonly sold crops. High-value crops, such as sweet potato (*Ipomoea batatas*), banana (*Musa* various cultivars) and peanuts (*Arachis hypogaea*) were most commonly ranked as the main crops sold at markets. Other commonly sold crops were Chinese taro (*Xanthosoma sagittifolium*) and a variety of leafy green vegetables.

Men in AroB became more reliant on copra as their primary income source (Table 2). In Rabagi, ENB, copra was one of the primary income sources for men, alongside waged employment. At Lamarinam and Tavilo, cocoa remained the main income source for men, although cocoa incomes were significantly lower than prior to CPB.

Table 2. Primary income sources for men “Just after” CPB and “Now” (% Households).

Period in relation to incidence of CPB	ARB			ENB		
	IRI	KOS	TEO	LAM	RAB	TAV
Just after	Copra (22%)	Copra & Fishing (22%)	Copra (27%)	Cocoa (64%)	Copra & Waged employment (23%)	Cocoa (35%)
Now	Cocoa (53%)	Cocoa (75%)	Cocoa (70%)	Cocoa (80%)	Mkt garden food crops (27%)	Cocoa (71%)

Also, some household income activities that were important prior to CPB were curtailed following CPB, such as village tradestores and small transport businesses that depended on patronage from the village community. Many village stores closed and remaining ones struggled to remain viable and so reduced levels of stock for sale. Smaller and more affordable quantities of store goods were sold in village tradestores in the years following CPB. To compensate for the reduction of income, smallholders pursued a myriad of small and at times, irregular income sources. These included, among others, the increased sale of cooked and processed food, betel nut, dried coconuts and fish either at local markets or at village roadside markets.

Land Use Change

In some areas of the Gazelle Peninsula, noticeable changes in land-use appeared as smallholders removed their cocoa and/ or expanded the planting of new crops in their search for alternative incomes. The planting of export cash crops, in particular, Balsa and oil palm increased as seen in Plate 1. In the background of this photo is Balsa – one of the first crops to be taken up by cocoa smallholders after CPB and promoted by DPI. There is some remaining cocoa, and in the foreground is oil palm. The latter is now expanding rapidly on the Gazelle Peninsula. Whilst some smallholders are now removing Balsa and planting the new CPB-tolerant clones, oil palm continues to

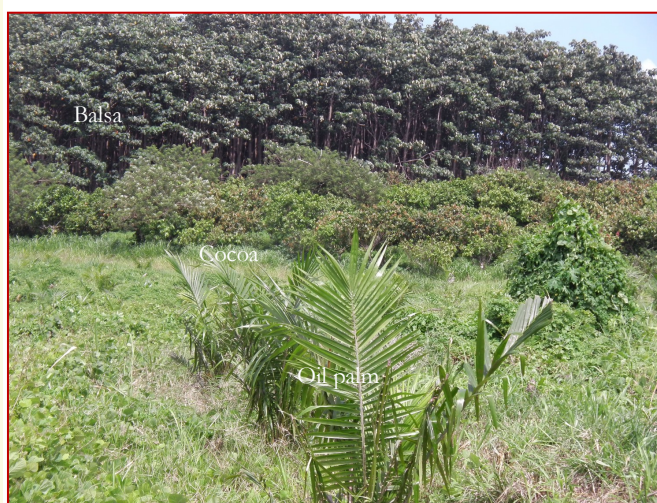


Plate 2: Post CPB landscape in ENB.

expand in the province. Thus a new post-CPB landscape has developed on the Peninsula.

Kinship and community networks

In the initial phases of CPB infestation in ENB, many smallholders drew on their social and kinship networks to provide support and reduce household vulnerability. For example, in the early phases of the infestation, many families visited relatives living in CPB free areas and were allocated cocoa harvesting rounds to assist them financially. However, this practice inevitably led to the rapid spread of the pest as new colonies of CPB became established away from the original infestation site.

Although many cocoa farmers have reduced their financial support for relatives (see earlier), families with relatives in formal employment and living in urban centres continue to depend on remittances from these relatives to assist with large expenses such as school fees. Some members of farming families have also temporarily migrated to spend time with relatives working in other provinces to reduce the economic pressures on the household. Being able to draw on social and kinship networks has provided an important buffer and safety net to cope with the stresses of CPB. Such 'uncertainty sharing' (Brookfield, 2001) through local social support systems is of major importance in diffusing risk and uncertainty, so as to enhance the viability of the farming system.

Skills development

The other path taken by many farmers to adapt to CPB and the new and uncertain environment in which they lived, was to attend training to develop new skills. In both ENB and ARoB farmers focused on training to assist them to improve their cocoa management skills, control CPB and to learn how to plant/replant and manage new hybrid cocoa clones (Figure 2 and Figure 3).

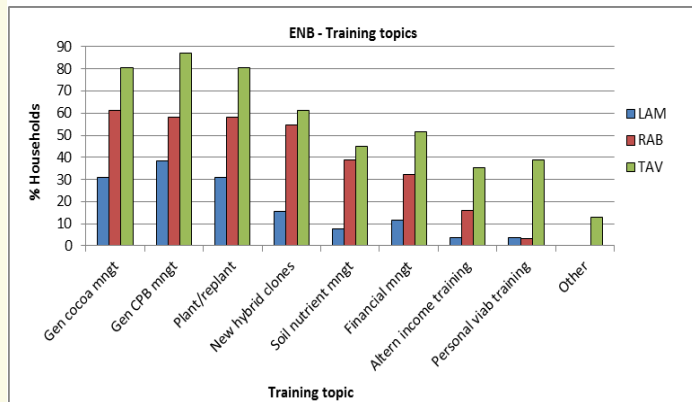


Figure 2: The percentage of households in ENB receiving skills training.

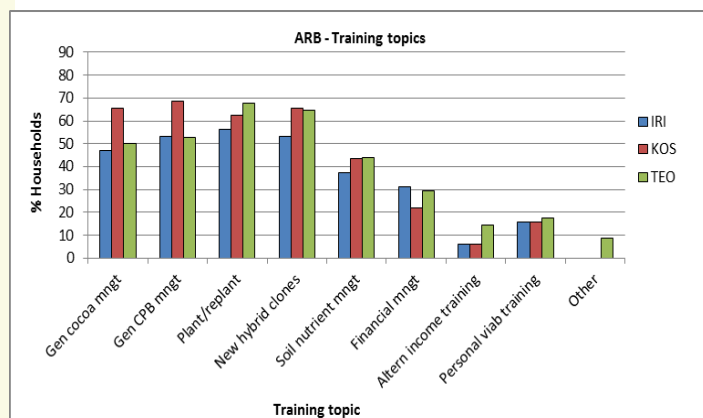


Figure 3: The percentage of households in ARoB receiving skills training.

As shown in Figures 2 and 3, smallholders were keen to develop new skills in financial management, alternative income training and personal growth and well-being. The willingness of many farmers to seek training in cocoa and non-cocoa related areas indicates their readiness to adapt to the changing and uncertain environment which CPB presented them to reduce household vulnerability to food and income security.

CONCLUSION

Cocoa farmers have responded to CPB and the loss of income in several ways. Most have shown a capacity to adapt to shocks and stresses on their livelihood and farming systems. Responses have varied: from smallholders expanding existing livelihood activities, establishing new livelihoods or reducing efforts in some economic activities as they became unviable. A primary coping strategy adopted by the majority of farmers was to expand garden food production, both for household consumption and sale at local markets. In the next note in this series we examine the role of gardens in maintaining food and income security in a post-CPB environment.

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