

“COCOASAFE”: CAPACITY BUILDING AND KNOWLEDGE SHARING IN SPS IN COCOA IN SOUTH EAST ASIA AND THE PACIFIC

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Abstract

Concerns about food safety have led many consuming markets such as the European Union (EU), USA and Japan, to enact legislation concerning accepted levels of pesticides and other harmful substances in imported commodities such as cocoa. Such legislation reduces cocoa producing countries ability to export their cocoa unless legislative and regulatory measures on sanitary and phytosanitary (SPS) standards are met. Any rejection of cocoa imports will impact both the GDP of the exporting countries and the livelihoods of the smallholder producers who grow cocoa. The “Cocoasafe” project was a multi partner project funded by the Standards Trade and Development Facility (STDF) and participating countries which aimed to strengthen SPS capacity through the cocoa supply chain in Indonesia, Malaysia and Papua New Guinea. The project aimed to improve the safety and quality of cocoa through developing capacity along in-country supply chains, both to understand the need for compliance to SPS measures and to conduct best practice to reduce harmful residues and contaminants. Knowledge sharing between stakeholder groups in the region was also facilitated. The training syllabus was adapted from CABI’s ‘Discovery Learning Manual’ to fit local farm management practices. Training topics included cocoa planting materials, shade management, soil health, pest/disease management, in addition to cocoa safety and quality standards. Best practice recommendations relevant to each country were included as well as raising awareness of contamination by heavy metals, pesticide residues, polycyclic aromatic hydrocarbons (PAHs) and mycotoxins. A Training of Trainers approach was used to train Master Facilitators who in turn trained local extension staff, lead farmers, post-harvest processors and input suppliers as Facilitators to pass this knowledge to farmers and other stakeholder along the supply chain. Pre and post-training surveys were conducted to evaluate the level of understanding of the training. Analysis of the survey data indicated that farmer leaders’ knowledge on GAP, pest/disease management and safe use of pesticides improved significantly, input suppliers understanding of pesticide regulations was improved while post-harvest processors had an improved understanding of compliance of cocoa storage SPS standards. Project outputs such as training manuals, videos and posters were translated into local languages as well as being available in English. In addition to the main training activities in the individual countries, CABI hosts and maintains project website where all training material and resources can be accessed (www.cocoasafe.org). This also links to individual country partner websites.

Introduction

Pests and diseases remain major constraints to cocoa production worldwide including SE Asia and the Pacific. Application of agro-chemicals is widely used to manage cocoa insect and fungal pests throughout the region. However, many cocoa consuming markets such as the European Union (EU), USA and Japan, are becoming more concerned with the issue of food safety with regard to cocoa especially in relation to pesticide residues but also other harmful substances such as Ochratoxin “A” (OTA), Polycyclic Aromatic Hydrocarbons (PAH), Free Fatty Acids (FFA) and heavy metals such as lead and cadmium. As a result, some cocoa importing countries have enacted legislative and regulatory measures on sanitary and phytosanitary (SPS) standards that have to be met by imported cocoa. Cocoa producing countries have to develop capacity in SPS standards if they are to conform to the requirements set by the cocoa consuming countries and maintain access to these lucrative markets. Through the cooperative work between CABI, the Malaysian Cocoa Board (MCB), the Indonesian Cocoa and Coffee Research Institute (ICCRI), the PNG Cocoa and Coconut Institute (PNGCCI), Mars, CropLife Asia and the International Cocoa Organization (ICCO) with funding from the Standards and Trade Development Facility of the World Trade Organization (STDF), the “Cocoasafe” project was conducted. This project aimed to strengthen SPS capacity through the cocoa supply chains in participating countries. The main goals of the project were to: i) Improve the quality of cocoa through capacity building in SPS, ii) Promote and facilitate knowledge sharing between stakeholder groups participating in the project and iii) Raise awareness among cocoa stakeholders on food safety concerns in the whole supply chain and how to address them.

In-country Activities and Outputs and discussion

Indonesia

The project was implemented as a joint project between Indonesian Coffee and Cocoa Research Institute (ICCRI) and CABI. The project adopted a collaborative regional approach and activities included 1) development of a locally adapted training syllabus; 2) training of Master Facilitator (TOMF); (3) training of Facilitators (TOF) for farm leaders and local extension staff, agro-dealers and processors; (4) training in best practices in postharvest techniques; (5) questionnaires were carried out to assess impact of training; and (6) development of a website to disseminate agricultural and food safety standards. Dissemination and sharing of knowledge on good practices in SPS and food safety was a key element running through all of the project activities i.e. publicity campaigns, training and knowledge-sharing approaches targeting the various actors of the cocoa value chain. Training materials were translated in Bahasa Indonesia. Training videos and posters were also produced and disseminated demonstrating best practices for cocoa production, harvesting, grading and export procedures. A total of 20 MFs were trained who went on to train 200 lead farmers and extension staff as TOFs, 180 traders/processors in good warehouse practices and 120 TOF agrodealers.

Studies before and after the trainings indicated that in East Java and SE Sulawesi, the percentage of farmers removing and burying all diseased pods in East Java, increased from 25% before training to 65% after training while in SE Sulawesi a similar trend was seen (75% of farmers conducting sanitation before training and 93% post training). This suggests a greater understanding of the value of good sanitation and could be linked to reduced pesticide use (reduced to 80%) in SE Sulawesi. Also post training, participating farmers were much more aware about fermentation practices with fermented beans sold at higher incomes. Farmers selling fermented beans increased to >70% in East Java and 40% in SE Sulawesi (after training). Wooden box fermentation was used in East Java and bamboo baskets in SE Sulawesi. In East Java, farmers dried beans using sun-drying on concrete cement floors (50% before TOF to 63% after TOF), while in SE Sulawesi, farmers used sun-drying on bamboo racks (87% before TOF to 94% after TOF).

Results from surveys pre and post training (18 months later) indicated that the TOFs for farmer leaders had improved their knowledge of GAP, pest and disease control, and safe use of pesticides. TOFs for agro-dealers increased retailers' awareness of regulations concerning pesticide sales while TOFs for agro-processors improved their knowledge of compliance of cocoa storage systems that is required to meet SPS standards. For example, before TOF, ca.79% of respondents stored cocoa as loose beans in a warehouse, but post training, the number of processors storing their cocoa in this manner, decreased significantly (to 29%). Further, before TOF, 21% of agro-processors in Lampung sprayed fungicides on cocoa in storage but after training, this number decreased to zero. In contrast, the use of traps in the cocoa storage facilities in Lampung was increasing. In Central Sulawesi, the number of processors who used pesticides in storage facilities was initially higher than those in Lampung (33% of processors used rodenticides and insecticides, while 22% used fungicides). Numbers of processors who use pesticides in Central Sulawesi is slowly decreasing after the TOF and the number of processors using traps increased from 22% to 33%. Also in Lampung, only 64% of processors were aware of new regulations relating to food safety but after training, 100% of respondents were aware about these new regulations. Similarly, in Central Sulawesi, only 66% of processors were aware about the new regulations before training but after TOF, 100% of respondents reported they knew and understood about the new regulations. This new knowledge could be linked to observed changes in behaviour in spraying regimes and storage in warehouses.

Malaysia

The project was implemented by MCB and CABI with CropLife Asia also providing support. Similar approaches were used for training the supply chain stakeholders with TOMF and TOF were conducted in various locations across Peninsular Malaysia, Sabah and Sarawak. Training materials were produced that included comprehensive curricula for cocoa including awareness-raising and best practices in Good Agricultural Practices (GAP), pesticides, food safety, mixing/bulking, traceability, worker safety, and SPS standards were developed (linked to Malaysian regulations and those of Japan and the EU) on maximum levels for pesticide residues, heavy metals, PAHs and mycotoxins. The content was developed by CABI, MCB, ICCO together with some expert input from other partner organizations. The main sources for the training materials were from Bateman (2013), Bijlmakers (2005), CABI (2007), CABI SEA (2008), ICCO (2008), Vos, et al. (2003), Malaysian Standards (2005a, 2005b). Training materials were translated in Bahasa Malay. Training videos were also produced and disseminated demonstrating best practices for cocoa production, harvesting, grading and export procedures. A total of 27 MF were trained from three regions in Malaysia, 152 lead farmers and extension staff were involved in the TOF sessions and 17 agrodealers were also trained in a separate TOF for agrodealers

Surveys were again conducted with farmers before the trainings and 18 months after the TOF activities had been conducted. This was to evaluate the project's impact in Malaysia. The evaluation included, for example, farmer profile, perceived major threats to cocoa production, measures used for pest and disease

management, fermentation process and others. This was done for all participants and information was gathered using questionnaires. Based on the 1st survey results on farmers, knowledge of pest and disease management was already high among the farmers and they could identify production constraints and generally manage these problems through cultural practices. Participants' awareness of information relating to pesticide levels in cocoa beans was moderate (56%) with most information on GAP and food safety provided by the agricultural extension service. Major problems identified in the initial survey eg Cocoa Pod Borer was perceived to have decreased in importance by the second survey (from 58% to 40%) which may indicate that the respondents/participants of TOF had adopted the practices they had learned in the TOF programme and felt more confident in managing this pest. Survey results also indicated that there was a 10% increase in the number of respondents only harvesting fully mature, ripe and non diseased pods (from 70% to 80% in the second survey). The quality of their cocoa had improved and consequently, their income (as determined by their sale records). With regard to sanitation practices undertaken by the responding cocoa farmers, many preferred to remove all the diseased pods which included those infected with black pod. 38% of respondents preferred to sell their cocoa beans as wet beans to a middle man in order to receive cash immediately and not having to wait for few days while the cocoa is fermented and dried. However, there were also indications that following training, some participants were adopting the fermentation process following training; 40% respondents chose to turn the beans every day for 5 days compared to 20% in the 1st survey. 90% of respondents knew the correct way to store their cocoa beans.

With regard to agro dealers, the majority had previously received training on the safe use of pesticides, pesticides residues and toxins from the Malaysian Pesticide Board, from MCB, and from pesticide manufacturers but few understood GAP nor knew about PAHs. In the project, the agrodealers' information was collected by face to face meetings with respondents from 3 regions (West Malaysia (3), Sabah (5) and Sarawak (3)). A survey of widely used pesticides used in cocoa including herbicides, fungicides, insecticides and nematicides, was collected. The agro-dealers were asked about the problems faced by their cocoa customers. Pests and disease problems were still the major concern to the agro-dealer's customers (72% agro-dealers agreed with this). Two further issues (low cocoa price and usage of ineffective pesticides) were highlighted by 55% of agro-dealers. All respondents supplied spraying equipment and fertilizers and some agro-dealers also provided credit to farmers in terms of agriculture inputs. 82% of respondents received information on the safe use of chemicals but only 50% of the respondents received regular information for distribution to farmers on pesticide use, GAP and food safety. Most of the information on safe use of pesticides are provided by the chemical manufacturers (73%) and followed by the chemical importers (36%). This is part of the chemical manufacturers and importers responsibilities to ensure their customers receive the latest update on safe use of pesticides. However, there was much less information on GAP with only 18% agro-dealers receiving information on GAP from chemical importers. Most of the agro-dealers needed to search through internet to obtain the information on GAP. This linked to the lack of actual training that the agrodealers received on GAP; almost 50% of respondents received formal training on safe use of pesticides but only 18% had received training on GAP and pesticide residues and most of that training had been received in the last 5 years. Most of the agro-dealers didn't know whether their employers were aware of the new regulations that being introduced in Europe and Japan concerning the levels of chemical residues, levels of heavy metals and mycotoxins permitted in cocoa beans and only 18% of the respondents were themselves aware of new regulations introduced in these markets. Nevertheless, chemical analyses conducted on cocoa bean samples produced by farmers who participated in the TOF sessions showed that beans produced were compliant with international SPS standards.

In PNG, the CABI TOMF Manual was adopted to be used in country by a team of CCIL's officers. Information on local cocoa production in different provinces of PNG, quality standards from PNG Cocoa Board and also 21 major pests and diseases in the country were added to the manual. The manual was used as part of TOMF training of the ACIAR Project on "Improved Management Strategies of Cocoa in PNG (HORT/2012/026) to be held in PNGCCIL, Rabaul in January/February 2017 to raise awareness of food safety issues.

In order to increase awareness of SPS issues, a project website was also created to share information and related materials of the CocoaSafe project (www.cocoasafe.org). The website included news and information on cocoa SPS standards and regulations, updates on the activities of the project, hosted training materials and gallery of images and videos. The main website also linked to other related websites including national project websites. Both MCB and ICCRI developed and host CocoaSafe pages on their institute websites containing content in local language (<http://www.koko.gov.my/cocoasafe/home.html> and <http://www.cocoasafeindonesia.id/>). The project website also facilitated stakeholder linkages with both private enterprises and public organizations, to make the whole approach to food safety in cocoa more cohesive. The CocoaSafe website will remain operational with current content until March 2019.

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