

Collective Action for the Marketing of Underutilized Tropical Fruits in South and Southeast Asia

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Abstract

Asia is the world's largest producer of tropical fruit. The marketing of fruit such as mango and banana is of major importance to the incomes and livelihoods of many in the region. However, there is also a wide range of lesser known fruits that are valuable in terms of food security and income and often have major cultural significance. The diversity of these fruits is threatened by land-use conversion and unsustainable harvesting practices and intervention is needed to protect them. Interventions for improved biodiversity management on-farm aim at increasing farmer utility for these resources through enhancing the income derived from them. The strategy to achieve this is by re-governing the markets for underutilized fruit products. Many obstacles in linking smallholders to markets have to be overcome and this can potentially be done through collective action. In this paper, three cases are described of the processing and marketing of underutilized fruit crops by farmer groups in India, Thailand and Indonesia, involving the species kokum, cowa and pomelo. This paper evaluates these cases using a conceptual framework for the process of collective action. It also attempts to assess the effect these chains and their enabling environment have on on-farm diversity and smallholder income.

INTRODUCTION

Smallholders that attempt to market their products generally face barriers to entry. Obstacles that arise include limited access to physical and financial resources, limited technical skills and no access to training, a lack of information on market requirements and prices, and a weak bargaining position with unequal distribution of profits along the chain, especially in the case of seasonal and highly perishable horticultural products.

In this paper we examine a possible strategy to overcome these market barriers through collective action. Naturally, problems with this approach exist, such as those related to property rights including free-riding of individual group members and disincentives to invest in intangible assets (Cook, 1995), and a lower level of flexibility to respond to changes in the production of the crop or market prices. Collective action may also require a high level of investment, both for members in the form of a membership fee and at the group level to build the capacity of smallholders to collaborate. Collective action may therefore not always be accessible for the most resource poor smallholders as they lack the required investment capital.

Specifically, we analyse the role of collective action for the marketing of underutilized species. These species are defined as locally abundant but globally rare (which implies a centre of diversity for the species), an abundance of local knowledge exists about them, but there is a lack of scientific knowledge, and current use is limited relative to their economic potential. These underutilized species are often of high local

importance in terms of nutrition, cultural value and income. Improving the market chains for these species and the information available about them will increase the income derived from them and create an incentive to grow and collect them (Gruère et al., 2006).

In this paper, we describe three cases of underutilized species from South and Southeast Asia and assess them using a conceptual framework of the process of collective action with the aim of identifying opportunities and obstacles for farmer-to-market linkages and the potential impact on agrobiodiversity. First, the conceptual framework will be described, followed by an overview of the cases. The paper will conclude with a discussion of the implications of the observations.

CONCEPTUAL FRAMEWORK

For the analysis of collective action for linking smallholders to markets we use the framework proposed by Kruijssen et al. (forthcoming) (Fig. 1), which is based on the premise that social capital, i.e. “the structure of relations between actors and among actors” (Coleman, 1988), provides the confidence to invest in collective activities and can substantially reduce transaction costs (Johnson et al., 2002). In the formation of social capital, concepts such as trust, reciprocity, common rules and norms, and connectedness play an important role (Pretty and Ward, 2001). The basis for the exchanges between the actors in a collective activity is a process referred to as ‘social learning’: “together they define problems, search for and implement solutions, and assess the value of a solution for a specific practice” (Koelen and Das, 2002). This process entails the shift from what is referred to as ‘multiple cognition’ to ‘collective cognition’. This denotes that the individuals in the collective move from being totally different cognitive agents and having multiple perspectives to a group with shared attributes such as theories, values and collective action. The most important aspect is that from individual perspectives a convergence takes place to a shared idea of how to improve a situation (Giere, 2002). The social learning process is seen as the engine for this collective cognition. The interaction that takes place during collective action also feeds back into the social learning process and will change the nature of social capital over time. The process of social learning is initiated by a trigger which can be external to those experiencing it, such as a natural disaster. However, this trigger will only lead to collective action if there is a constraint to carrying out the activity individually, there is a willingness to collaborate and a certain level of connectedness is already present (McCarthy, 2004). The forces that then drive the process to continue, the catalyst, can either be external in the form of public sector agencies such as government, NGOs or research institutes, or internal which is often a so-called ‘chain-champion’, a farmer or other market chain actor that takes a leading role. The driver can also play a role in bringing together the possible collaborators and establish the existence of the pre-conditions such as mutual trust (Kruijssen et al., forthcoming).

To evaluate the effectiveness of collective action in terms of the outcome from market participation for smallholders, we utilize the ‘structure–conduct–performance’ (S-C-P) analysis more commonly used in market chain analyses. The term ‘structure’ refers to the environment in which institutions and agents operate in the market such as the number of buyers and sellers in a chain. The ‘conduct’ of a market chain deals with the coordination between the actors and how these are interrelated (Keizer, 2003). For collective action, these two concepts can be described through the five characteristics of a collective: (i) status (e.g. association, history, network, cluster); (ii) membership (e.g. number, size and activities of members); (iii) functions (e.g. economic, social, political); (iv) governance (e.g. selection of members, selective incentives, sanctions, hierarchical vs. participatory decision making, trust); and (v) level (horizontal or vertical, i.e. within an actor group or among different actors) (Tuan et al., 2006).

The ‘performance’ of the outcomes of collective action can be measured in terms of its effectiveness, efficiency and equity. Effectiveness can be measured by the stability of supply, the maintenance of product quality, the duration of the delivery process and product variety. The term ‘efficiency’ refers to a situation wherein resources are used

optimally; i.e. where they create the most benefit and prices are in line with costs. The term 'equity' concerns the power relations in the market chain (Keizer, 2003). In an equitable market chain, margins, bargaining power and risk are distributed equally among the actors.

These concepts have an important bearing on the incentive problems usually associated with collective action. Two types are distinguished; i.e. investment related and decision related problems (Borgen, 2004). Investment related problems are identified from the perspective of property right theory and include; (1) the free-rider problem, which occurs mainly in open membership cooperatives and refers to current or non-members not bearing the full costs of their potential benefits; (2) the horizon problem, which is associated with a shorter residual claim of a member on the net income generated by an asset than the productive life of that asset; and (3) the portfolio problem, which refers to the situation that individual members have a limited ability to adapt their investments in a cooperative under changing risk preferences. Decision related problems come from agency theory and include; (1) the control problem, which arises in situations where the ownership and leadership of a cooperative are separated and there is a divergence of interests (Cook et al., 2004; Borgen, 2004); (2) the follow-up problem, which is mainly expected to occur if there are many members, each unable to significantly influence decision making and individually to capture only a small fraction of benefits from collective activity; and (3) the influence cost problem, which appears when different groups of owners exist within the collective with different interests (Borgen, 2004). These incentive problems can cause underperformance and even failure of collective action. It is outside the scope of this paper to treat all these incentive problems in detail, however, they are implicit in the functioning of the groups and the case studies offer a few potential means to overcome them.

METHODOLOGY

Data for the case studies was collected in the context of a project that aimed to gain an understanding of the role of markets for the management and use of tropical fruit trees. For kokum, data was collected in the Sindhudurg district in Maharashtra state of India. Data on cowa was collected in Chanthaburi province in Thailand, and information on pomelo from the Magetan district in East Java in Indonesia. All data was gathered during 2006. In all three cases, informal interviews were carried out with group members and other chain actors to obtain information on the groups and their formation; the production, processing and marketing activities; and the species they grow or collect. Specific questions were also asked on the costs of processing and the income obtained from these products. It must be emphasized that these case studies were chosen as examples of good practices in the marketing of biodiversity. Information is therefore mostly descriptive in nature and does not bring out all possible obstacles for collective action in linking smallholders to markets and on-farm agrobiodiversity conservation.

RESULTS

Kokum in India

1. Case Description. *Garcinia indica*, commonly known as kokum, is an underutilized fruit tree, native of the Western Ghats in India. It grows mainly in the western parts of Maharashtra, Karnataka, Kerala and Goa. The fruit is used as a treatment for obesity; the rind as a souring and food colouring agent; and fat from the seed is extracted for cosmetic and confectionery preparations (Patil, 2005). The seed is separated from the pulp and the rind is dried, resulting in 'sole', a product that is used in curries. Processing units transform the seed into kokum oil or butter, which is considered to be a high value product and is used in cosmetic products and for cooking purposes. Small-scale farmers in the Sindhudurg district in Maharashtra state are able to market their produce through a horticultural society which provides them with a relatively secure outlet for their dried kokum rind and the kokum seeds. Cases from other regions of India where kokum grows

in abundance have shown that this is not the case there, due to a lack of organization and outlet (Kruijssen and Sudha, 2008).

2. Trigger/Driver. The society was initially established to improve the marketing of major horticultural crops. Kokum was later included because around 30% of the members had some kokum trees and were facing difficulties marketing their products. The society has a board and staff that are responsible for the management of the society. In the region, many other facilities that benefit the kokum market exist, such as a kokum foundation, university seminars and a fruit research station that is evaluating kokum varieties and has released an improved cultivar. These aspects also ensure that growers remain interested in maintaining the crop.

3. Structure and Conduct. The society was established in 1964 and has as its main activity, the marketing of horticultural products through its nine bazaars. It has approximately 9,000 members from all over the state and 24 collection centres where members can sell their horticultural products. The organization of the society is highly hierarchical and it has a sizeable administrative workforce. This lowers the society's flexibility to changes in the market but allows for limited influence on the society's activities by individual farmers. Due to the size and structure of the society, the level of social capital is very limited as the members do not interact with one another and do not need to do so for the operation of the collective.

4. Performance. The society provides the farmers a guaranteed outlet for part of their produce; however the demand for 'sole' is limited. It is packed by the society and sold in its bazaars. Seed is much more important in terms of quantity and is sold to two processors, one nearby and one more than 900 kilometres away in the state of Andhra Pradesh. The intervention of the society guarantees sufficient quantities for economies of scale, thereby reducing transaction costs. Prices that are paid for kokum rind are slightly lower than in the local market (Kruijssen and Sudha, 2008). However, farmers are willing to accept a lower price, because the time that would otherwise be spent selling the product in the local market can now be spent on other activities. Members thus value the role the society performs and the society therefore absorbs part of the margins in the chain. Of the total quantity of horticultural crops sold through the society, kokum only constitutes about 0.1% of total gross returns. An average grower, who may have about 10 kokum trees, is able to produce approximately 300-800 kg annually, depending on the age of the trees, which will yield him up to 200 kg of dried rind and up to 100 kg of seed. With an average price of Rs 30 per kg for the rind and Rs 9 per kg for the seed, an individual farmer is thus able to earn up to Rs 7,000 per year (equivalent to US\$150), with limited costs of production.

5. Biodiversity. The kokum growers in this district were compared to individual growers in Karnataka state where collective action is not in place and the market chain has severe constraints. There, farmers have abandoned the collection of kokum because of poor prices and a lack of outlets. Whereas the improved market chain provides growers in Sindhudurg with an incentive to maintain their kokum trees, those in Karnataka, where such incentives are not present, have no more interest in the maintenance of their trees (Kruijssen and Sudha, 2008).

Cowa in Thailand

1. Case Description. *Garcinia cowa*, commonly known as cowa-mangosteen or cowa, is one of the 22 *Garcinia* species that have been reported in Thailand, of which mangosteen (*Garcinia mangostana*) is probably the most well known. Cowa is a small to medium-sized tree of which both the young shoots and the fruits are edible (Yapwattanaphun et al., 2002). The group we consider is based in Chanthaburi province in Thailand and produces a range of tropical fruit products including a local dish made with cowa leaves (*Moochamung*).

2. Trigger/Driver. The group was established after a major storm damaged the community's durian and mangosteen trees and caused the still immature fruits to drop. The quality of these fruits was considered to be too low to be marketed as fresh products

and therefore some of the female members of the community decided to process the fruits in their homes. The district's agricultural extension office assisted them in the establishment of the cooperative and provided capacity building on processing. This encouraged the group members to process more frequently from their homes and to include other species. Supported by the Department of Agricultural Extension, processing equipment was purchased and in 2002, a small outlet and a processing facility were built. Their group organization has given them access to the training required to successfully apply for the food hygiene and safety certification (Kruijssen and Somsri, 2006). Hence, the process of social learning that was triggered by a natural hazard has been further facilitated by government and non-government agencies.

3. Structure and Conduct. The women's group that presently consists of 40 members was established in 1983 and was the first cooperative group in their district. In recent years it has joined the 'One Tambon One Product' (OTOP) program, which is based on a similar Japanese program and was put in place by the Thai government in 2001 to improve the availability of local resources and produce goods that are acceptable internationally in order to help encourage and promote tourism down to the village (tambon) level and increase rural income from the sale of their products (OTOP website, 2006). The group has been able to enter the OTOP program's highest product-quality level.

4. Performance. Cowa leaves are procured from the members of the cooperative. The members can each buy cooperative shares at Bht 100 (equivalent to US\$2.66) as an investment in the cooperative. At the end of each year, profits from their investments are distributed to the members. Members also receive wages for their labour and the group provides credit facilities. The estimated annual profit of the group is US\$5,000 and wage labour is paid at US\$3 per day. As a result of their collective action, women have substantially increased their income from tropical fruit tree products and have overcome the problems of oversupply of some fruits. After producing for thirteen years, the group had managed to streamline the organization and become an example for other groups, illustrated by the receipt of a provincial award for the governance and performance of their organization. Profits are distributed according to investments and hence individual annual income from participation in the group will depend on the availability of working capital at the start of the year. All members have an equal opportunity to contribute labour for the processing of the products and thus earn additional income from wages, although this will also depend on their other activities in the household. The democratic structure of this women's group and the relative small size ensure that the power balance within the group is fairly even.

5. Biodiversity. The fresh, young cowa leaves are harvested from the members' home gardens and in some cases from the wild. When trees become too high to easily harvest the leaves, they are either cut halfway or new seedlings are planted, which illustrates their willingness to maintain cowa in their home gardens instead of replacing it with other (major) crops.

Pomelo in Indonesia

1. Case Description. *Citrus maxima* (or *C. grandis*), with the common name pomelo, is believed to be closely related to the grapefruit. Although the fruit is widely used in the Southeast Asian region, where it is native and unquestionably not underutilized, it is less well known in other parts of the world. The place of origin is most likely Indonesia, Malaysia and Thailand. It is a bushy tree with fruits that are the largest among the citrus species and a rough light green to yellow skin. Underneath the skin, the fruit has a thick white spongy layer that encloses the actual flesh of the fruit. The flesh is white, light yellow, pink or rose-red and juicy, with a sweet sour or spicy sweet taste (Yaacob and Subhadrabandhu, 1995). Although fresh pomelo is sold on a large scale, we examine a women's group located in the Magetan district in East Java, Indonesia, that processes the white spongy skin of the pomelo into sweets. The group is one of only a few that process the pomelo skin and compared to the quantity that is marketed fresh, processing is very

limited.

2. Trigger/Driver. The group was established when insects attacked pomelo (fruit fly and fruit borers) and caused the fruit to drop, rendering them unsuitable for fresh sales. A government agency developed a method to produce candy from the white skin of the rejected fruits and assessed the potential for successfully introducing this activity with a survey among community members. It was concluded that the women in the community had more spare time and the agency therefore brought a group of women together and trained them in the processing activity.

3. Structure and Conduct. The group consists of 25 female members and was founded in 2000. The group is a member of the district's Pomelo Association which has approximately 60 member groups. The women's group has a democratic structure and the members have monthly meetings.

4. Performance. The group's members each contributed Rp 1,000 monthly (equivalent to US\$1.30 on an annual basis per member) and US\$78 in total. Total annual profits are estimated at US\$150 and the activity provides income for a total of approximately 420 labour days per year, which is paid at US\$1.66 per day. All members receive identical returns for their annual investment. However, it is the payment for wage labour that provides most revenue. Total individual income from the processing activity therefore depends on the availability of members' time. The group also provides credit for its members.

5. Biodiversity. Three main cultivars are grown in the district where the group is located. This diversity is maintained because of differences in the taste and appearance of the candy and differences in the market share of the cultivars. The cultivars also differ in harvesting time. One of the cultivars however is less suitable for the group's processing activities because of its thinner spongy skin and is therefore only procured if there is no alternative. Raw material is procured from both members and non-members. As processing activities only constitute a very small share, it is the differentiation between the cultivars for fresh consumption that increases the incentive for farmers to maintain them. However, whereas one of the three varieties is not as popular in the fresh market in Jakarta, this variety is very suitable for processing.

DISCUSSION AND CONCLUSIONS

The case studies in this paper have shown that collective action can be seen as a social process that can be triggered and driven by a range of factors. In the cowa case from Thailand, a group of women initiated the processing of fruits to overcome oversupply and damaged fruits. The initial success and the strong presence of shared values, agreement and trust among the women and the support of government and NGO's provided the engine for further social learning, 'collective cognition' and capacity building, and facilitated the formation of social capital. In the pomelo case in Indonesia, a similar process took place where the initial trigger was also provided by damaged fruit and a possible solution was introduced by a government agency. However, both cases also indicate that continuous investments are required from the members, for which returns are paid annually. In the case of cowa, benefits are higher for those who have access to a higher level of investment capital, whereas differences in income from the activities in the pomelo case mostly depend on labour availability. In both cases, external (public) investment was provided in terms of capacity building and capital for machinery. The kokum case differs from the two other cases in its structure and conduct. Due to its size and hierarchical structure, social learning is limited and the level of social capital present is low. Income depends solely on the amount of produce delivered and the society is rather an alternative market outlet than a collective.

The cases have shown that collective action has the potential to lower transaction costs and improve the market chain, which in turn provides an incentive for biodiversity maintenance. This becomes clear in the case of kokum, where the marketing of seed was established because the society was able to amass and transport it to long-distance buyers. Furthermore, the networks established through collective action will also greatly enhance

the information exchange and awareness about the biodiversity present on-farm and both will increase the demand for diversity on-farm. This was most apparent in the case of cowa, where information transfer from government and non-government agencies to the group took place. This information transfer would not have taken place without the existence of the group.

The incentive problems that are generally associated with cooperatives are not equally apparent in the three cases. Individual investments are limited in the case of pomelo and kokum. Investment in processing equipment in all cases is limited, as financial assistance was given in both the pomelo and the cowa case, and the need for processing equipment is low in the kokum case, addressing the horizon and portfolio problems. Many of the incentive problems do not apply to the cowa and pomelo cases as the groups are small, members are able to buy shares and receive the benefits on an annual basis, and the membership (after an initial establishment period) is relatively fixed. Furthermore, the social learning that has taken place has increased 'ownership' and trust and this also reduces the free-rider problem. For the same reasons, the decision related problems are also not very apparent in the cowa and pomelo cases as there is no separation between the management of the group and the members. The case of kokum is at first sight most hampered by incentive problems due to its hierarchical structure and large size. Both the decision and investment related problems seem to be abundant in this case. However, the members do not regard them as major obstacles as they consider the society mostly as a secure outlet for their agricultural products.

Finally, it should be noted that even if there is a willingness and motivation to collaborate and investment capital is available, collective action may not be successful and sustainable or even desirable. Factors such as the composition of the group, previous experiences with collective action, product characteristics and the type of market that is targeted will greatly influence the outcomes of collective action. Alternatives such as stronger vertical integration in the market chain may be more effective, both in terms of farmer income provision and public investments. The effect of such interventions on biodiversity should then also be considered carefully.

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Figures

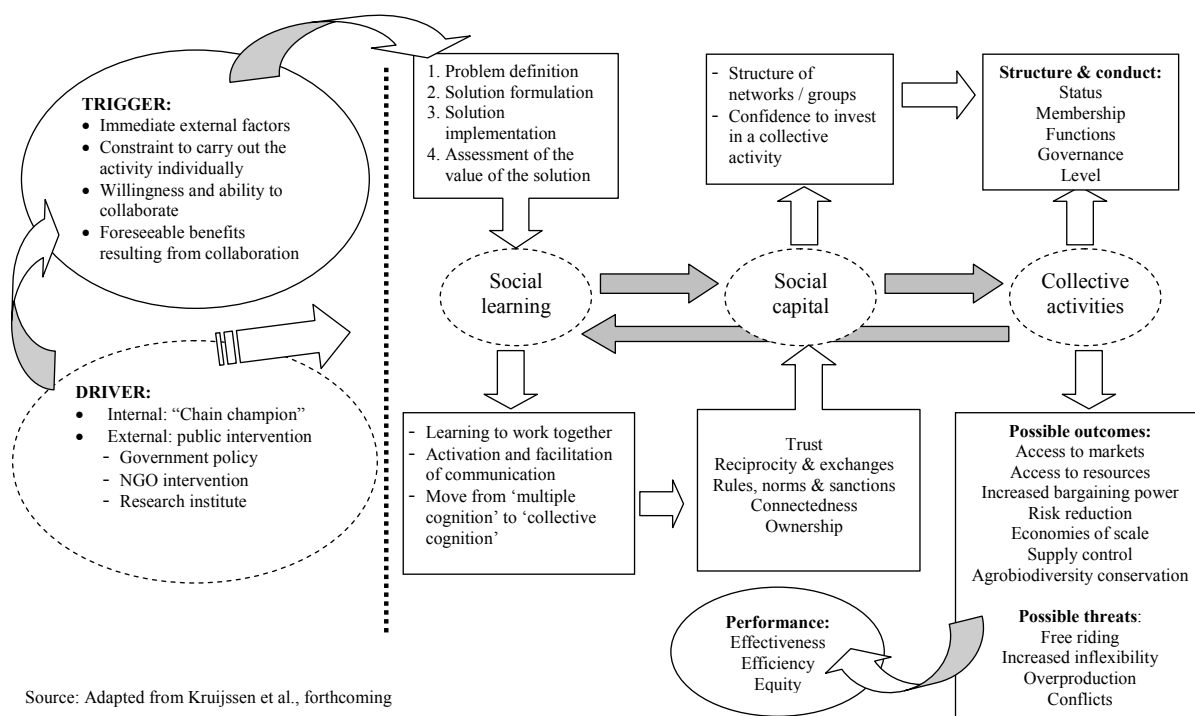


Fig. 1. The process of collective action in smallholder market participation.

