

A study on gender participation in post-production operations of selected fruits in Trinidad and Tobago

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This study was undertaken in Trinidad and Tobago as part of the project, 'Enhanced Preservation of Fruits using Nanotechnology', which focussed on pre- and post-harvest treatments for delayed ripening and post-harvest extension of shelf life of fruits. The purpose was to gauge the type of impact the project outcomes was likely to have on post-production operations for mango and papaya through increased availability of fruit for processing and the potential effect on gender participation in Trinidad and Tobago. Convenience sampling was used to collect data from six countries in Trinidad and Tobago. Retail outlets located along major roadways in Central and South Trinidad were surveyed. Additionally, phone surveys of processors (well-established processing plants and cottage industries) located in Tobago and in East, Central and South Trinidad were conducted. A structured questionnaire was administered to respondents at mini-marts, supermarkets and roadside parlours. Frequency counts and percentages were used to analyse the data collected. Four main activities were identified – i) the production of preserves in well-established processing plants and cottage industries, ii) the production of preserves in small-scale home units, iii) the distribution and sale of products from the processing plants and cottage industries, and iv) sale of products from home processing. Findings revealed that, in all cases, the production of preserves and other processed products from mango and/or papaya occurred alongside the production of preserves and snacks from other commodities, and that production was always linked to availability of the raw material for processing. In all cases encountered in the survey, preserved products from mango and papaya were made from unripe fruit. The major source of preserved fruit sold in retail outlets was well-established processing plants and cottage industries located across the island with smaller quantities coming from home processing. Retail outlet operators indicated that preserves were delivered to them via middlemen so that negotiations for sale occurred between the operator of the retail outlet and middlemen, with no input from processors. Most of the surveyed processing plants and cottage industries (71%) were owned and/or managed by men. Men were also predominant as middlemen in the collection and transport of preserves to retail outlets. Women were more likely to be the sole operators in retail outlets, particularly in roadside parlours (83%) and mini-marts (64%). The study also found that of the respondents interviewed, those engaged in home processing of mango and other fruits were all female, selling the preserved snacks in their own or family-owned roadside parlours. Given the survey results, it was concluded that the potential for increased utilization of mango and papaya fruit in preserved forms would be greatly enhanced by the project outcomes that resulted in increased availability of fruit in the unripe state. Further, this was likely to affect females more than males, since mostly females were sole operators in retail outlets, and were engaged in relevant post-production processing activities at the household level as well as in the sale of preserved products for increased household income.

Keywords: Gender participation, post-production operations, mango, papaya, preserved fruit products

In Trinidad and Tobago, as in the rest of the Caribbean Region, fruit production and utilization are important activities in the food and agriculture sector. Mango (*Mangifera indica* L.) and papaya (*Carica papaya* L.) are among the more popular tropical fruits and have become commercialized for national, and to a lesser extent, international trade, supplying domestic municipal markets, supermarkets and roadside parlours, with large volumes being traded and consumed in the ripened state. These fruits are produced in backyard gardens, mixed fruit orchards and on small-scale

agricultural holdings. Mango is a seasonal fruit while papaya is readily available, albeit sometimes in smaller quantities, throughout the year.

Popular mango cultivars produced include *Julie*, *Starch*, *Vert/Long*, *Doux doux*, *Rose*, *Graham* and *Calabash* (UWI 2010, 3). Papaya varieties produced include *Red Lady*, *Tainung No. 1* and *Tainung No. 2* (Trinidad and Tobago. MALMR 2008). In 2010, the Ministry of Food Production, Land and Marine Affairs (now Ministry of Agriculture, Land and Fisheries) estimated annual consumption of

mango and papaya to be 50 and 1,716 tonnes respectively (Trinidad and Tobago. MFPLMA 2011). National production supports domestic consumption as well as international, regional and a very significant domestic trade in processed products from these fruits.

The importance of the contribution of processed fruit to the domestic market cannot be over-emphasized. In 2011, the Food and Agriculture Organization of the United Nations (FAO) estimated that 90 per cent of tropical fruits produced worldwide is consumed domestically, 5 percent is traded as fresh fruits and 5 per cent is traded as processed products (FAO 2011). However, in some countries, a significant quantity of the domestic fruit production consumed is as processed products, with the processed fruit utilization arising out of necessity to deal with glut supplies of seasonally available fruit or to circumvent potentially high levels of post-harvest losses from extremely perishable fruit types. This is true of Trinidad and Tobago, where mango and papaya are largely consumed as fresh fruits but also form the basis of a very lucrative preserved fruit market, targeting children and young adults and serving as snacks popular at social gatherings, festivals and sporting events and available at mini-marts, roadside parlours and supermarkets. Additionally, many of these items become part of an informal “suitcase trade” supplying the demand of ethnic populations primarily in North America and Europe.

In Trinidad and Tobago, it is surmised that women play an integral role in the processing and retailing of snacks, whereas men are generally more involved in the transportation and distribution from processors to retail outlets. Given that women are more likely to participate in the production and sale of these items, the extent of their involvement needs to be determined in order to assess its relevance and potential contribution to income generation and poverty alleviation in rural and single-parent households led by women.

Theoretical perspectives

Buckland (1993) describes gender participation as the roles and activities of men and women according to traditions and beliefs of a particular culture. The lack of awareness of specific gender roles in and contributions to farming and food security is known as “gender blindness” (FAO 1998). Where men may be dominant in agricultural production activities, women tend to be more active than men in some of the post-production operations along the agricultural value chain (Sarku 2016; Adefalu, Adekunle and Komolafe 2016). The theoretical perspective of the gender division of labour for agriculture is that the women in rural agrarian societies would specialize in activities centred on the household whereas the men are the ones more engaged in business activities outside of home (Alesina, Giuliano and Nunn 2011). The literature documents that the roles of men and women are constantly in flux depending on the socioeconomic condition of the rural communities. With the continuous marginalization of rural, agricultural communities especially in developing and less developed countries (Admassia and Abebaw 2013; Cecchini and Scott 2003; Ghimire 2002; Ghattas et al. 2013), rural women are now seeking more viable options to source income.

The literature shows that women in agrarian societies are mostly responsible for ensuring household food security and food sovereignty whereas, men in agrarian societies more focus on diversifying their business operation, investing in new business opportunities and expanding their scope of operations (FAO 1998). Due to the productive and household roles of women in agrarian societies, home based processing and cottage industries are now popular income earning activities for many rural women. A study conducted by Rugumamu (2009) showed women were more involved in processing and packaging maize for home storage in Eastern Tanzania. Harris-White (2005) highlighted

that women primarily manage household retailing as a post-harvest operation for rice in South Asia but still depend on men for wholesale and middlemen services. Adeyemi (2010) stated that women were primarily involved in processing and storage of primary agricultural produce, but it is often viewed as household responsibility rather than a productive role, especially in the patriarchal household.

Scholarly work on women in agriculture in the past twenty years has focused on documenting the activities of women in relation to men extending beyond the traditional views of the gender divisions of labour (Kanji, Tan and Toulmin 2007). As societies globally are more gender sensitive, the changing agricultural policies, globalization forces and technological advancements are all re-shaping the social and economic landscape for rural men and women.

This study was undertaken in Trinidad and Tobago as part of the project, 'Enhanced Preservation of Fruits using Nanotechnology', which focussed on pre- and post-harvest treatments for delayed ripening and post-harvest extension of shelf life of fruits. The study was conducted to ascertain gender participation in the operations associated with production, procurement and sale of preserved products from mango and papaya. The main purpose was to gauge the types of impact the anticipated project outcomes: i) increased time of fruit retention on the trees, ii) reduced post-harvest losses through increased shelf life, iii) longer period of fruit availability in the unripe state through increased time to ripening, were likely to have on post-production activities and specifically, to identify from a qualitative perspective, which gender was more likely to be affected in the post-production phase of mango and papaya.

Materials and methods

This study was carried out in the rural communities of eastern, central and south Trinidad, as well as in south-west Tobago during November 2016. Rural areas were targeted rather than urban areas since it was anticipated that the type of operations described in the study were more likely to be found in rural areas. The sampling framework adopted was convenience sampling. Convenience sampling is a non-random sampling method that relies on data collection from individuals who are easily accessible and available to participate in a study. There is no inclusion criteria identified prior to the selection of participants, who are typically interviewed wherever they are located (Research Methodology 2017). Convenience sampling allows ease of research and data are collected fairly quickly. However, this type of sampling may not represent the population as a whole and may be vulnerable to selection bias (Research Methodology 2017).

Six counties in Trinidad – St. George East, Caroni, Nariva, Mayaro, Victoria and St. Patrick, and one county in Tobago – St. Andrew, were surveyed. Field surveys of retail outlets started in Chaguanas and proceeded south to rural communities in the Trinidad counties identified above. Phone surveys of well-established processing plants and cottage industries in St. George East, Caroni and St. Andrew were also conducted. Processors were selected based on the fact that their products were sold at the surveyed retail outlets. All clearly visible retail outlets on or near to the major roadways were targeted. Total numbers were small as expected for small island states with small populations such as Trinidad and Tobago. A total of 14 processing plants and 117 retail outlets were surveyed. Retail outlets consisted of 52 mini-marts, 41 supermarkets and 24 roadside parlours.

In this study, a mini-mart (also known as a convenience store) was defined as a small retail business that stocked a variety of products including snacks, baked goods, beverages, toiletries, newspapers and over-the-counter drugs. Some mini-marts formed part of a petrol station establishment. A supermarket was defined as a retail store that primarily stocked fresh and processed foods, along with some household items and small-scale appliances. A roadside parlour (also called a “tuck shop”) was defined as a downsized mini-mart which was strategically positioned along roadways to provide easy accessibility for commuters.(or making it easily accessible to commuters) Some roadside parlours were located near to schools and stocked items such as bakery products, snacks, confections, juices and drinks.

Data were collected through a structured questionnaire designed with both open and closed-ended questions. Questionnaires were administered to prospective respondents who were willing to participate at the mini-marts, supermarkets and roadside parlours. Respondents were interviewed in order to identify – i) the most common type of establishment where preserves made from mango and/or papaya were sold, and ii) the gender of key players in the relevant post-production activities related to mango and papaya – operation of retail outlets, sale of preserved fruits and procurement of preserved fruits. The term ‘operator’ was applied to the person in charge of day-to-day activities in the retail outlets, including vending and procurement. Processing plants and cottage industries were surveyed to identify gender differences in the ownership and/or management of these establishments. The expression ‘home processing’ as opposed to ‘cottage industry’ was applied to situations in which products were made by individuals as a household operation and offered for sale with no name applied to the establishment, no use

of labels or approved packaging and no apparent conformity to processing regulations. The collected data were coded and electronically entered using the Statistical Package for the Social Science (SPSS) Version 20 software. With the non-random sampling framework, questionnaire design and variety in target populations sampled, the data collected were assigned as qualitative and interpreted as such. Trends, descriptive and frequency counts were used to assess the qualitative data in order to accomplish the primary objective of this study. Figured illustrations describing gender participation were used to highlight the findings and outline the participation of men and women in post-production activities for mango and papaya. The data were not conducive for any inferential statistical techniques and the study objective did not need this rigour of statistical analysis.

Results and discussion

Gender differences in ownership/management of processing plants and cottage industries

Preserves and other processed products from mango and/or papaya as well as from other commodities were made at well-established processing plants and cottage industries in Trinidad and Tobago. All the products identified were made from unripe fruit. It was found that production was always linked to availability of the raw material for processing. At the time of the survey, mango was abundant, so a greater quantity of mango preserves (than other fruit preserves) was processed and distributed to the retail outlets. Most of the surveyed processing plants and cottage industries (71%) were owned and/or managed by males (Figure 1), indicating that more men than women were likely to own and/or manage the well-established processing plants and cottage industries.

Gender participation in operation of retail outlets

Roadside parlours had the highest percentage of female participation as operators (83%), followed by mini-marts (64%) and supermarkets (51%). By contrast, male participation as operators was highest in supermarkets (49%) and lowest in roadside parlours (17%). It was also found that roadside parlours were mainly operated by one person (Figure 2).

These findings imply that a higher concentration of women than men in the research area saw the need to extend their income availability in order to support their families, so they had to take available jobs that were close to home. It was also interesting to

note that women who were otherwise unemployed and unskilled, tended to open a roadside parlour and sell, among other items, fruit preserves that they made themselves to increase their income. The majority of mini-marts and roadside parlours were located near the operators' homes because it was convenient to the women who were mothers to keep their babies and younger children close to them during the day.

The survey found that relatively equal numbers of males and females occupied supervisory positions in supermarkets in the sample. This reflected a positive change from known traditional roles and is possibly reflective of the rising prevalence of women employed in the food retail sector.

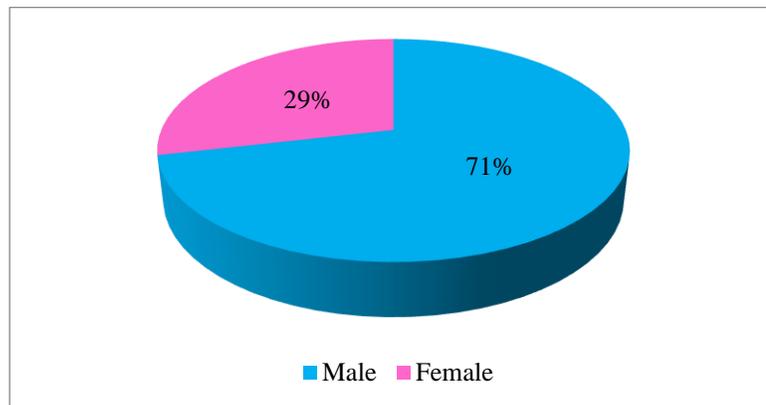


Figure 11: Gender of owner/manager of surveyed processing plants and cottage industries.

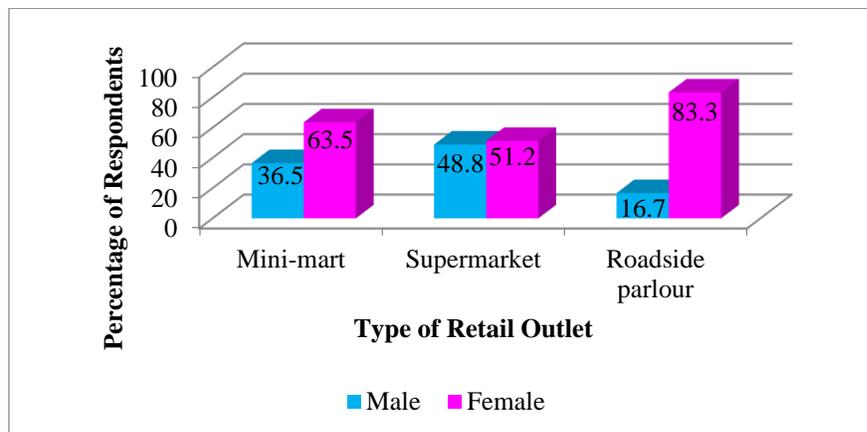


Figure 2: Gender participation in operation of retail outlets.

Gender participation in the sale of preserved fruits

Preserves made from mango and/or papaya were sold in mini-marts, supermarkets and roadside parlours. More females than males were involved in the sale of mango and papaya preserves in all retail outlets (Figure 3). Anecdotal evidence suggests that papaya and other fruits are usually processed to make preserves and snacks when mango is not readily available. All respondents in the study were involved in the sale of mango preserves at their respective outlets, reflecting the significance of availability in their determination of which fruit was processed. However, not every respondent sold preserves made from papaya (16% males and 20% females) and other commodities (58% males and 68% females). Other fruit preserves and snacks sold at retail outlets included those made from other locally produced fruits. Generally, women's participation was higher than men's in the sale of mango, papaya and other fruit preserves (Figure 3).

With respect to the packaging of fruit preserves, the majority of respondents (97%) sold mango preserves in transparent, sealed plastic bags. Labels were not always used and were usually absent from packages of products

that were prepared at the household level. A small percentage of products (3%) was sold wrapped in brown or waxed paper, again reflective of the level of the operation. Of the respondents who sold papaya preserves, 91% used transparent, sealed plastic bags. Others used paper strips which were similar to those used for mango preserves.

Gender participation in procurement of preserved fruits

The respondents who sold preserves at retail outlets indicated that they either made the preserves at home, or procured them from middlemen. Middlemen were defined as independent distributors who typically acted as the intermediary between the fruit processors and retail outlets.

The respondents who processed fruits into preserves (all females) indicated that they did the processing activities at their homes and then sold the home-made preserves at their respective retail outlets. This information suggests that women, particularly housewives, are the ones who engage in fruit processing at home, and sell the products to school children and adults who conveniently stop at the roadside parlours and mini-marts, located along the main roads.

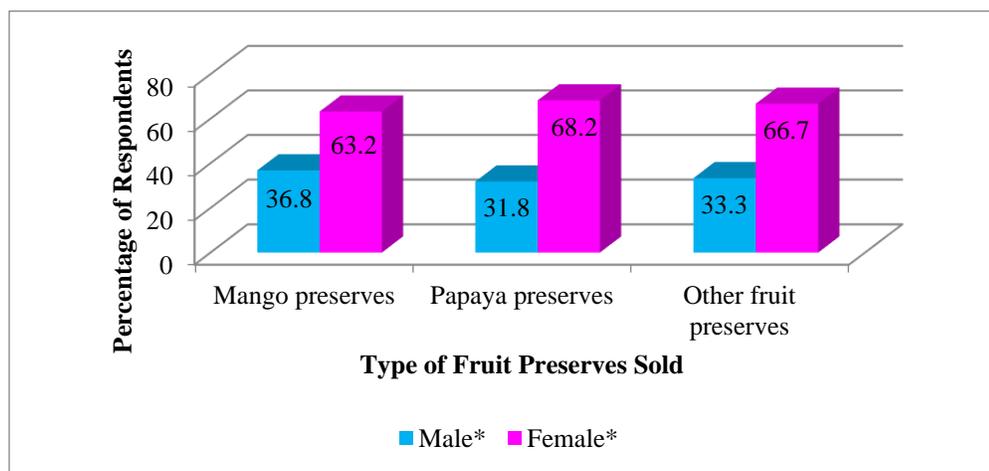


Figure 3: Gender participation in the sale of preserved fruits at retail outlets.

Note: * = Multiple responses

The operators of retail outlets indicated that all middlemen who supplied them were males. This supported the notion that females were less involved in this activity because they preferred to stay close to home to conduct home-related activities including the supervision of minor children. Therefore, the role of middlemen is supportive of women who serve as operators of retail outlets since their procurement of items for sale is largely through that avenue.

Conclusion

The study indicated that mango and papaya fruits were used to make preserves which were supplied to various retail outlets (mini-marts, supermarkets and roadside parlours) in Trinidad and Tobago. At the time of the study, mango preserves were the most popular fruit preserves sold in retail outlets particularly because mangoes were in season and abundantly available to processors. Production of preserves was done in well-established processing plants, cottage industries and household units. Most of the surveyed processing plants and cottage industries were owned and/or managed by males indicating that males are more influential in the financial decision-making when it comes to post harvest production. This finding is similar to the disposition of Damisa and Yohanna (2007) and Ogunlela and Mukhtar (2009) who postulated that men still maintain a significant control of financial resources and financial decisions.

The study also indicated that a greater number of women than men was involved in the sale of mango, papaya and other fruit preserves at all surveyed retail outlets. Female participation as operators was higher than men in the roadside parlours and mini-marts while in supermarkets, there was gender parity. This finding was similar to findings of Harris-White (2005) which identified a higher involvement of women in small retailing outlets for rice in South Asia. The majority of mango and papaya

preserves was packaged in transparent and sealed plastic bags and distributed via middlemen to operators at the different retail outlets. Men were the main players in this activity (transportation and distribution) while mainly women were involved in home processing of fruits and the selling of fruit preserves in their respective places of business. The study findings correspond to the theoretical perspectives within the gender division of labour for agriculture outlined by Alesina, Giuliano and Nunn (2011), as the women observed in this study are seemingly more involved in post-production retailing around the household based on the convenience of maintaining household responsibilities whereas men are more engaged in post production activities away from the household.

The results obtained from this study suggest that the project will be useful to all operators who are involved in the post-production processing activities of fruits. Since fruit preserves, widely consumed by children and young adults in Trinidad and Tobago, are prepared from unripe fruit, the technologies used in the project will be expected to impact positively on the availability of raw material for production of these items. This, in turn, may provide the opportunity for income generation for operators in the post-production sector, especially women, since it has been shown that mostly females are engaged in relevant post-production processing activities at the household level and in the sale of preserved products for increased household income.

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