

GOOD PRACTICES FOR MAINTAINING DIVERSITY OF TROPICAL FRUIT TREES THROUGH VALUE ADDITION ACTIVITIES BY WOMAN FARMERS IN EAST JAVA

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ABSTRACT: The tropical fruits genetic resources, had a vital roles on nourish and source of income of local people as well as natural preservation. The study which was conducted at two sites in East Java Province, Indonesia during 2011 to 2012. The research goal is to describe the significane of empowering women group to improve processing and market local mangos and citrus products. The study have proved the income contribution from mango and citrus production and its derivatives in both sited may reach 51 and 55 percent of total family income. To overcome of cheap price of fruits in the harvest season and enhance processing activities, training on processing techniques of mango was carried out by Assessment Institute for Agricultural Technology (AIAT) in cooperation with NGO for the women farmers groups. In both sites, the processing units use all local varieties of fruits from the home garden and forest. Products currently are just sold in the local markets. Market expansion with an efficient distribution process in the future through promotion efforts may increase total consumers demand and marketing area. The practiced have maintaining diversity of tropical fruit trees through empowered women group to get the value added from local varieties of mango and citrus by process product and group marketing.

Keywords: conservation, fruit trees, women, value addition

INTRODUCTION

East Java in one of the Provinces in Indonesia which become the center of origin and diversity of numerous globally important tropical fruit tree species and their wild relatives (GEF 2008). This diversity is treasured for the livelihoods of local people throughout the country both as a source of nutrition and income as well as for urban consumers at the local, regional and even global levels for their nutritional properties (Maharjan et.al. 2011). On the other hand, most of the rural farming communities in East Java still lack the access to information regarding agricultural biodiversity, conservation, and communities in research and development activities (GEF 2008).

On-farm conservation is a management process by which farmers maintain the local crop varieties that they identified or developed within the local conditions and continued to manage and improve. On-farm conservation activities tend to

focus on persuading farmers to keep planting local varieties. This study primarily focuses on educating farmers about the value of local crop diversity, fostering the sense of pride in their cultural heritage of local diversity and promote its use at home or for sales (Sajise 2003; Sthapit et.al. 2008).

The linkage of smallholders to agricultural markets through farmer organizations, value chain integration linking farmers directly to consumers or retailers, targeting high-end customers in distant markets and improvement of governance and collaborations in value chains are still considered to a strategic tool for poverty reduction (Sajise 2003). However, increased sales to more distant markets with strict food safety requirements also require farmers to produce more uniform products and food safety policies may restrict the entry of certain products. Farmers are attempting to comply with the international standards may, as a result, lose agricultural biodiversity on their farms. This

however does not necessarily mean that agro biodiversity is not mattered in agricultural markets.

The significant share of tropical fruits produced is still sold in the domestic market rather than being exported. Local markets, which may provide more opportunity for agro biodiversity to be sold, however, are often associated with significant price volatility, a lack of value addition and the inadequate price premium for high quality. There is, thus, need to target relevant markets and products and enable smallholders to participate (Kruijssen and Somsri 2006; Bartlett 2008). The focus issue of this study is Good Practices (GP) on marketing and additional value activities of local mango and citrus species conducted by women farmers in Tiron community, Kediri sites, and Bibis community in Magetan Site, of East Java Provinces. Exploring local market opportunities and niches is often overlooked as an effective strategy for improving livelihoods and creating market value for local agricultural biodiversity. This paper exposes some examples how a market strategy for local markets can help farming communities to improve income, gender equality and conserve agricultural biodiversity.

Women play a significant role in the management and utilization of fruit tree diversity. However, their role is often not recognized. Women in Indonesia are traditionally involved in following activities related to fruit trees such as propagation, production, processing, and sales. However, often they have not participated in marketing yet, or their knowledge about traditional uses, processing techniques are being neglected while these can be of importance when exploring markets. Empowerment is defined as an emancipation process in which the disadvantaged are empowered to exercise their rights, obtain access to resources and participate actively in the process of shaping society and making decisions (Luttrell and Quiroz 2009). Indicators of empowerment are knowledge, collective action, self-decision making and access or ownership of assets (Kasmel and Andersen 2011).

RESEARCH METHODS

The focus areas of this GP are marketing and additional value activities of local mango and citrus species by women farmers in Tiron community, Kediri, and Bibis community in Magetan, of East Java Provinces. GIS reference of locations is 6048'47 S, 1070 36'52 E (Kediri) 7039'50 S; 1110 11'43 E (Magetan). Name of farmers Group

practiced in this GP in Tiron is Sumber Mulyo Farmer Group, whereas in Bibis is Lumbung Makmur Farmer Group Union. The study was carried out from August 2011 to January 2012 involving the village leaders, members of farmer groups as well as villagers in the two targeted communities.

The study focusing on propagation, production, processing and sales of local mango and citrus produces. The study aims to elaborate on Good Practices (GP) conducted by the communities on marketing and additional value activities of local mango and citrus species by women farmers in Tiron community, Kediri sites, and Bibis community in Magetan Site, of East Java Provinces. The data were obtained through conducting a baseline survey, in-depth interviews with key informants as well as FGDs (Focus Group Discussions) in both studied locations which are important production centers and genetic resources of mango and citrus in East Java. The descriptions of communities studied in both sites are illustrated in Table 1.

Within this study, market and non-market values of mango and citrus tree genetic resources will be assessed and proper practices for marketing and management of these resources will be characterized. On the approach to avoid the rapid loss of genetic diversity (genetic erosion) is through on-farm conservation activities.

The goal of this research is to improve livelihoods and food security of target beneficiaries through women empowerment to sustain and utilize Tropical Fruit Trees (TFTs) genetic resources. By strengthening the capacity of women farmers' and users' groups will assure long-term implementation of practices that conserved and sustainably utilized tropical fruit tree genetic resources. The study tries to develop a system that will promote well-balanced working between partners and stakeholders at the community level, develop an institutional framework, empower women farmer and establish mechanisms to generate support of policy makers. With regard to this circumstance, the capacity of women farmer, women farmers group, and the related institution need to be strengthened.

RESULTS AND DISCUSSION

The Characteristics of Biodiversity and the Marketing Activities

Tropical fruits genetic resources play an imperative role in nourishment and as a source of income for

people as well as its essential role in nature preservation. This study describes the significance of empowering women groups to improve

Table 1. Description of Communities Studied

processing and local market of mangos and citrus products contributing to natural conservation.

Site location (village)	Availability of agro-ecological systems	Income per capita or household	Importance of fruit trees for households – share of revenue and labor	Connection and access to markets	Potential for starting up right practices – presence of institutions	Appreciation of and interest in maintaining Tropical Fruit Trees (TFTs) diversity
Tiron, Kediri	Most trees found in commercial orchards. Many HH's have home gardens, Communal/buffer zone or natural forests found in this area.	Many big plantations. Estimated 80% sales 20% home consumption. HH's in site are mostly poor farmers living from subsistence farming	Many households have a home garden and fruit production. As a result, the plantation is the prominent business in this area.	Fresh fruits distributed and transported to another province by the inter-regional - trader. The home garden produces sold to local market. Some fruit processed by home industry and sold locally.	International NGO named REI from the USA active on agricultural investment and assistance. Farmers are well organized, women groups available.	High interest because farmers look for an additional mean of income.
Bibis, Magetan	Most trees found in commercial orchards. Many HH's have home gardens	Income is high, mostly from commercial citrus orchards.	Many households have a home garden and fruit production. As a result, the plantation is the prominent business in this area.	Many interregional traders found on this site. Fruits brought to major market in Jakarta and Surabaya. Citrus commonly sold to collecting agents and used for fresh consumption	Farmers are well organized. Many women groups with home industry activities.	High interest because farmers look for an additional mean of income.

Detail of sites characteristics and biodiversity setting in the studied areas are described in Table 2. Tiron site covering a lowland area of about 26.700 ha, with elevation 500 Meters Above Sea Level (MASL). Located in the center of East Java Province. With an average annual income from

TFTs of RP. 1,500,000, - (US\$ 150, -) per farmers family. The mango fruits are usually sold directly by the farmer to the middlemen or the local market. From mango fruits it only may contribute 15-20 % of the family income.

Table 2 .Sites Characteristics and Biodiversity Setting in Studied Communities

Indicators	Inter and intra-species diversity	Income	Connection and access to markets	Existence of institutions	Appreciation in maintaining TFTs diversity
Tiron, Kediri	3 Mangifera species found, At least 26 local varieties mentioned for Mangifera indica	From HG Estimated 80% mango sales 20% home consumption.	Fresh fruits distributed and transported to another province by interregional traders. The home plantation produces sold to local markets. Some fruit (10%) processed by home industry and sold locally.	International NGO named REI from the USA active on agricultural investment and assistance. Farmers are well organized, women's groups available.	High interest because farmers look for an additional mean of income.
Bibis, Magetan	6 citrus species found, 8 varieties of pummelo (Citrus gaudisi) mentioned	Income is high from citrus, mostly from commercial citrus orchards in HG	Many interregional traders found on this site. Fruits brought to major market in Jakarta and Surabaya. Citrus commonly sold for collecting agents and used for fresh consumption	Farmers are well organized. Many women's groups with home industry activities.	Commercially manage

Source: Field survey, 2011

Bibis site is the centre of the genetic resources of citrus in East Java, where the community has rich varieties of the citrus species as main crops in their home plantation. The site covers a lowland area of about 247.830 ha, with altitude 105 MASL, located in the mid-west of East Java province. The main income of the household averages about RP. 15,00,000 - (US\$ 1500, -) from pummelo fruits. The total population of pummelo citrus trees is more than 50.000 trees, with an average yield of 100-200 kg/tree. The fruits are usually sold directly by each farmer to the middlemen or the local market by the farmers' group.

Figure. 1 describes the characteristics of the existing supply chain system in the field. In this region, mangoes and citrus are generally consumed as a fresh fruit. Less than ten percent (10%) of the total production is processed into processed form. Fruits are mostly consumed to meet local market through the traditional supply chain. Most of mango and citrus produced in the field are marketed into the region of surrounding East Java provinces, and some of them are marketed to the outside province. In both sites, the Good Practices and involvement by woman processing group through processing activities focus on the use of all local varieties of fruits from the home

plantations. Exploring and expanding new market channels with an efficient distribution process in the future through product variations and promotion efforts may increase consumers demand and marketing area (Figure 1).

The Description of Good Practices by Women Farmers in the Areas

Women farmers group processed only a few of variety of mango (variety/var. Podang urang/Mangifera indica) and citrus (var. adas nambangan/Citrus maxima) initially. Currently, the groups process for many variation of product such as dried mango (from var. podang urang, podang lumut, madu), Dodol/toffee mango (from var. gadung, golek, dodonili), mango juice (from var. kweni), mango sweet (from var. pakel, jaran), leather mango (from var. podang urang, podang lumut, madu) (see Table 3). Whereas product derived from citrus are: sweet pummelo rind (from all var. pummelo), Jelly (from var. jeruk gulung, pamelomagetan), Juice (from var. jeruk manis, keprok, sunkis), as well as local uses for medicine and spices (var. purut, sitrun, pecel and nipis) (see Table 3).

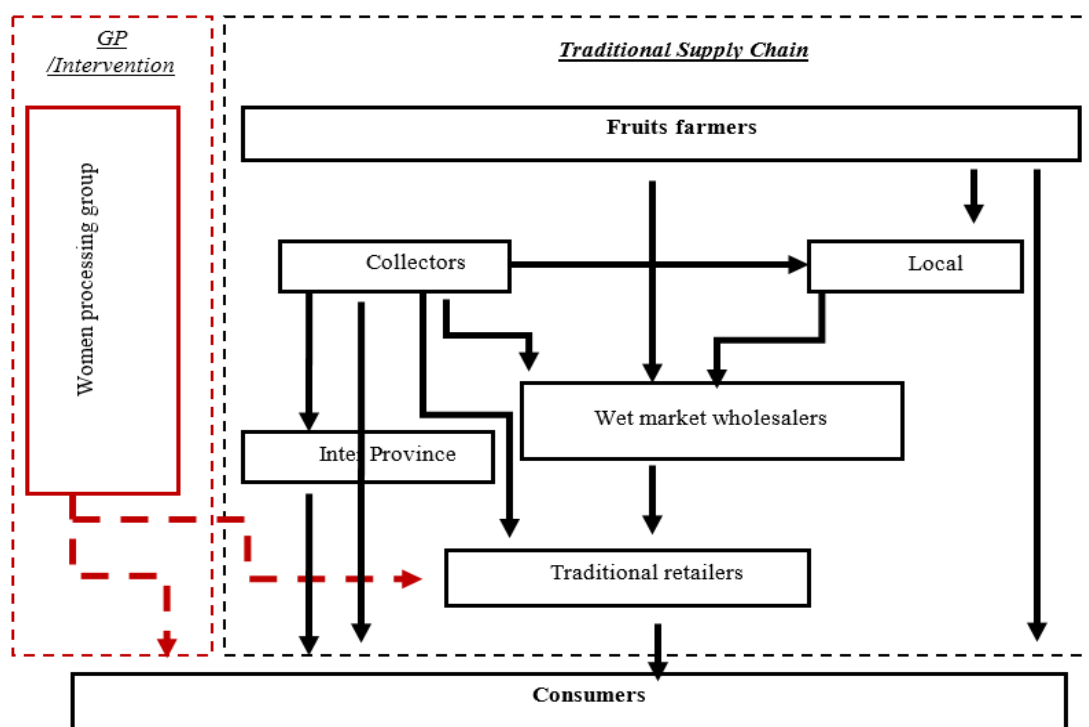


Figure 1. Supply Chain Map of Traditional and Good Practices of TFTs in Kediri and Magetan

Table 3. Identified products and niche markets for local diversity

	Product or niche market	Preferred variety of mango	Preferred variety of Citrus
A	Processed products		
1	Dried processed	Podang Urang, Podang lumut, Madu	All rind of <i>Citrus grandis</i> Sp
2	Dodol /Toffee	All local mango	All rind of <i>Citrus grandis</i> Sp
3	Juice	All local mango	All local citrus
4	Sweets	Pakel, Jaran, Kweni	Jeruk purut, jeruknipis, citrun
5	Used for raw fruits salad	Gadung, Golek, Dodonilo	All flesh of <i>Citrus grandis</i> Sp
6	Medicine and spices	Pakel, Kweni	purut, sitrun, pecel and nipis
B	Fresh sales channel		
7	Preferred by consumers in local market	Podang urang, podang lumut	Jowo, Jeruk Gulung, Sri Nyonya, Bali merah
8	Preferred by consumers in outside Java Island	Dodonilo, Santok Buto, Santok kapur, Kweni	Adas Duku, Bali putih
9	Preferred by consumers in Big cities in Java Island	Gadung, Manalagi, Golek, Madu, arumanis	Nambangan, Adas duku, Bali putih
10	Preferred by consumers intra East Java Province	Lalijiwo, podang urang, arumanis, gadung	Sri Nyonya, Bali merah

Source: FGD, 2012

The system maintains and enhances inter and intra-crop diversity. This system creates a diverse option to farmers for using many local types of mango and citrus because the raw material of processed product produced by women farmer group come from many types of local mango and citrus species and varieties. Furthermore, farmers expand their option in planting a numerous fruits in

their home garden and forest. The practices maintain the diversity of tropical fruit trees through empowered women group to obtain the value added from local varieties of mango and citrus using activities in propagation, production, processing, and sales product through group marketing (see Table 4).

Table 4. The Involvement and Empowerment of Women farmers in TFTs Activities

Indicators	Propagation	Production	Processing	Sales
A. The Involvement				
Traditional role of women related to mango and citrus diversity	Collecting seed and maintain nursery	Weeding, watering, harvesting	peel, washing, packing	Financial maintaining/ assistance
Traditional role of men related to mango and citrus diversity	Exchange planting material, Collecting new scion and establish nursery	Plant protecting, fertilizing	Drying	selling

Table 4. The Involvement and Empowerment of Women farmers (Continued)

Indicators	Propagation	Production	Processing	Sales
B. The Empowerment				
Indicators of empowerment for women - knowledge	Decision to choose the commercial variety planted	Experience in production (weeding, watering and harvesting) technology	Skill to process the fruits into added value products	Market information (price, place, volume, and time)
Indicators of empowerment for women – collective action	Seedling preparation to be planted by woman group	Woman groupwork for harvesting and collecting the fruits	Processing operation through woman groups	Partnership with NGO and Private Sector
Indicators of empowerment for women – self-decision making	Selecting fruits variety	Time to planting, weeding, watering and harvesting	Range of processing products, raw material resource	Target market and price
Indicators of empowerment for women – access or ownership of assets	Seeds storage facilities	Production inputs and equipment	Processing equipment and brand of the products	Financial accounts, loan, and credits

Source: FGD, 2012

This study indicates that the GP have proved confirmed empowering women group can improve processing and marketing local mangos and citrus production. It is because each processing of products needs a particular species and varieties of fruits. For examples, product derived from mango are dried mango (from variety/var. of podang urang, podang lumut, madu), Dodol mango (from var. of gadung, golek, dodonili), mango juice (from

var. kweni), sweet mango (from var. pakel, jaran), leather mango (from var. podang urang, podang lumut, madu). Whereas, products derived from citrus are sweet pummelo rind (from var. of jowo pummelo, adas, bali merah), Jelly (from var. of jeruk gulung, pameloma getan), Jus (from var. jeruk manis, keprok, sunkis), as well as local uses for medicine and spices (from var. of jeruk purut, sitrun, pecel and nipis) (see Tabel 5 and Table 6).

Table 5. Traditional use or unique trait of each var. Mango belongs to Kediri community

No	Local name	Species	Origin	Abundance status	Traditional use or unique trait
1	PodangUrang	<i>Mangifera indica</i>	Local	Common	Fresh consumption, suitable for processing, Uniform size, sweet taste, specific aroma, Reddish in colour, Fibrous
2	Podang Lumut	<i>Mangifera indica</i>	Local	Common	Fresh consumption, suitable for processing, sweet taste, specific aroma, Fibrous, yellowish red flesh colour
3	Madu	<i>Mangifera indica</i>	Introduced	Rare	Fresh consumption, Sweet taste, specific aroma
4	Golek	<i>Mangifera indica</i>	Introduced	Common	Fresh consumption, big fruit size, sweet taste, specific aroma
5	SantokButo	<i>Mangifera indica</i>	Local	Rare	big fruit size, sweet taste, specific aroma

Source: Baseline survey, 2011

Table 5. Traditional use or unique trait of each var. Mango belongs to Kediri community

No	Local name	Species	Origin	Abundance status	Traditional use or unique trait
6	Gadung	<i>Mangifera indica</i>	Introduced	Common	Fresh consumption, Sweet taste, specific aroma
7	Cantrik	<i>Mangifera indica</i>	Local	In danger	Sweet taste, specific aroma
8	Lali Jiwo	<i>Mangifera indica</i>	Local	Rare	Sweet taste, specific aroma, high in vit C content
9	Endog	<i>Mangifera indica</i>	Local	In danger	Uniform size, sweet taste, Whitedishin colour, Fibrous Sweet taste
10	Manalagi	<i>Mangifera indica</i>	Introduced	In danger	Fresh consumption, Sweet taste, strong aroma
11	Dodonilo	<i>Mangifera indica</i>	Local	In danger	Fresh consumption, yellowish red flesh colour
12	Beruk	<i>Mangifera indica</i>	Local	In danger	Fibrous, high water content
13	Sengir	<i>Mangifera indica</i>	Local	In danger	Sweet taste, distinct and robust aroma
14	Empok	<i>Mangifera indica</i>	Local	In danger	Fibrous, high water content
15	Apel	<i>Mangifera indica</i>	Introduced	In danger	Reddish in color, contains high vitamin C
16	Gajih	<i>Mangifera indica</i>	Local	In danger	Fibrous, high water content
17	Gurih	<i>Mangifera indica</i>	Local	In danger	Sweet taste, specific aroma
18	Ireng	<i>Mangifera indica</i>	Local	In danger	Sweet taste, specific aroma
19	Doso Muko	<i>Mangifera indica</i>	Local	In danger	big fruit size, sweet taste, specific aroma
20	Santok Kapor	<i>Mangifera indica</i>	Local	Rare	Fresh consumption, suitable for processing, Fibrous, high water content
21	Cantek	<i>Mangifera indica</i>	Local	In danger	Sweet taste, specific aroma
22	Lulang	<i>Mangifera indica</i>	Local	In danger	Sweet taste, specific aroma
23	Lanang	<i>Mangifera indica</i>	Local	Rare	Small fruit size, yellowish red flesh colour
24	Katul	<i>Mangifera indica</i>	Local	In danger	Small fruit size, yellowish red flesh colour
25	Bader	<i>Mangifera indica</i>	Local	In danger	Sweet with a little bit sour taste, Fibrous
26	Jempol	<i>Mangifera indica</i>	Local	In danger	Small fruit size
27	Jaran	<i>Mangifera foetida</i>	Local	Rare	Fresh consumption, good for processing, Big fruit size, taste good, yellowish red flesh colour, high in vit C content
28	Pakel	<i>Mangifera foetida</i>	Local	In danger	For processing, sweet with a little bit sour taste, Fibrous, high in vit C content
29	Kopyor	<i>Mangifera laurina</i>	Local	Rare	Fibrous, high water content
30	Kweni	<i>Mangifera odorata</i>	Local	In danger	For processing, Fibrous, high moisturecontent, robust and specific aroma

Source: Baseline survey, 2011

Table 6. Traditional use or unique trait of var. citrus belongs to Magetan community

No.	Local name	Species	Origin	Abundance status	Traditional use or unique trait
1	Adas	<i>Citrus grandis</i>	Local	Common	Fresh consumption, long selflife, bitter sweettaste
2	Adas Duku	<i>Citrus grandis</i>	Local	Common	Fresh consumption, long selflife
3	PameloMagetan	<i>Citrus grandis</i>	Local	Commercial	Fresh consumption, high in vit C content
4	Sri Nyonya	<i>Citrus grandis</i>	Local	Commercial	Taste good, redish red flesh color, High vit C content
5	Bali Merah	<i>Citrus grandis</i>	Local	Commercial	Taste good, redish red flesh color, High vit C content
6	Bali Putih	<i>Citrus grandis</i>	Local	Commercial	Fresh consumption, long selflife, bitter sweet taste
7	Jeruk Gulung	<i>Citrus grandis</i>	Local	Endanger	Big size, long selflife, Fresh consumption, sweet taste
8	Jeruk Jowo	<i>Citrus grandis</i>	Local	Endanger	Big size, long selflife, Fresh consumption, sweet taste
9	Nambangan	<i>Citrus grandis</i>	Local	Common	Fresh consumption, long selflife, sweet bitter taste
10	Keprok Siem	<i>Citrus reticulata</i>	Introduced	Endanger	Fibrous, high water content, high in vit C content
11	Keprok Pulung	<i>Citrus reticulata</i>	Introduced	Endanger	Coarse, high water content
12	Keprok Manis	<i>Citrus sinensis</i>	Introduced	Rare	Coarse, high water content
13	Sunkiest	<i>Citrus sinensis</i>	Introduced	Rare	High vitamin C
14	Jeruk Purut	<i>Citrus histryx</i>	Introduced	Rare	Small in size, High vitamin C
15	Jeruk pecel/ nipis	<i>Citrus aurantiifolia</i>	Introduced	Rare	Small in size, High vitamin C
16	Sitrun	<i>Citrus medica</i>	Introduced	Endanger	Fibrous, high water content

Source: Baseline survey, 2011

The practice maintains the diversity of TFT through empowered women group to get the added value from varieties of local mango and citrus using processed product and group marketing. In the beginning, the farmers have already had their own processing technique. Moreover, in both project sites then they got training from, the government research Institution (AIAT), Brawijaya

University, and NGOs (REI and Pummelo Association) provide them training to improve the processing technology. Further, the system has been practiced by 90 farmers in Kediri and 30 farmers in Magetan. It spreads out to the other villages and following this system (see Figure 2 and Figure 3).



Figure 2. Mango processing activities and its products by Tiron's woman farmer group in Kediri
Picture credit: Kuntoro Boga Andri (Foto taken at 2011)



Figure - 3. Sweet pummelo rind produced by women farmer group in Bibis, Magetan
Picture credit: Kuntoro Boga Andri (Foto taken at 2011)

Impact of the System on Livelihoods and Social Well-being

Fruit trees belonged are paramount for food security and source of income for farmers' through marketing and processing activities. This system successfully proves that empowering women's group can improve processing and marketing local mangos and citrus production.

The average incomes from TFT for the Household in the studied area are significantly necessary. From mango fruits only in Kediri, it may contribute 12% on average to the family income.

While in Magetan, it can achieve 32% of the total income. The income contribution may increase from 12%, become 51% for mango, and from 32% to 55% for citrus when the farmers processed the mango and citrus and sell it product self. Since the system provides women jobs and generate additional income for households, it will stand for longer periods (see Table 7). Since the system provides women jobs and generates additional revenue for households, it will stand for more extended periods.

Table 7. Average income contribution for households from fruit trees without and with processing activities (%)

Community	Income Contribution Without TFTs Processing			Income Contribution With TFTs Processing		
	From Fruits	Other Agriculture Activities	Non-Agriculture	From Fruits	Other Agriculture Activities	Non-Agriculture
Tiron, Kediri	12	28	60	51	16	33
Bibis, Magetan	32	16	52	55	11	34

Source: Baseline survey, 2011

This system also shows the enhancement of livelihood assets through the empowering human capital, mainly using women group empowerment, innovation training, packaging improvement targeted to the customer, and production and market training for product export. These good practices enhance social capital by arousing awareness on collective actions, strengthening skills of women groups in collective actions and local institutional building and equitable sharing of profits and risk amongst member of shareholders. Also, it is enhancing natural capital by exercising diversity assessment of home gardens that have the potential to market.

This system use many types of local mango and citrus from home gardens or semi-commercial

orchards, promoting dried mango, mango juice, mango dodol, mango leather, as well as sweet of pummelo rind, pummelo jelly, and citrus juice to the local market and maintaining the diversity of mango and citrus for sustainable fruits production. Also, this system enhances financial capital by mobilizing funds from saving and credits fund for micro-loans, training on credit investment for SMEs, establish a business plan for processed mango/citrus and establish a link to market outlets. At least, this system enhances physical capital by the construction of infrastructure and processing facilities, developing prepared mango and citrus home industry, training on running mango and citrus facilities, strengthening the capacity of woman group and private fruit nurseries and

creates a link with the external network regarding marketing.

This system demonstrates livelihoods strategies by employing collective action and organization to do the processing of mango for additional income, processing and marketing of numerous local mango and citrus products, and improve the quality of product and increase the sale. Also, we need to concern on conducting regular woman group meeting, organizing need-based skill to enhances training, strengthening the capacity of woman group, and maintaining transparency of running woman group as well as creating a proper management of local mango and citrus in the orchards and home garden and expansion of mango trees cultivation into forest area.

This system provides credit facilities to individual women farmers and provides labour for wages. As well as woman group uses micro credit provider from local government to establish processed fruit facilities, setting up the market outlets of woman group in the community. This system, regarding the livelihood outcome, provides the greater opportunity for revenue by employing women in group work as well as shares revenue and creating a link with other network of value chain actors.

This system provides the provision of sustainable benefits to farmers as well. Ministry of

Agriculture awarded the grant to PUAP scheme (Rural Agribusiness Enterprises Development) program for financial support and mango products recognized for export quality by local NGO as well as the physical infrastructure of the woman group established as results of collective action. This GP has impacts on awareness of processing technology enhancement, the partnership development, women empowerment, income supplementation, diversity mango and citrus maintenance, stakeholder benefits, increasing income, the improvement of diversity value, raising awareness of community, collaborations development and community empowerment.

Development Opportunities and Challenges

This GP of empowered women has proven to increase the added value of fruit, by purchasing and processing of fruit during harvest season when the prices of fruits down and providing wages for working in grain processing work. The conditions favouring success by empowering women groups create the financial capital of woman group by the purchasing of shares by the members. The constraints of the success area lack of an explicit policy support to elevate the absence of research among community and the insufficiency development of new type of product (see Table 8).

Table 8. Driving forces and conditions favouring or hindering successful the System

Good Practice	Driving forces	Conditions favouring success	Constraints
Woman group	Increasing the added value of fruit, by purchase and processing of fruit during harvest season	Empowering women groups Creating financial capital of woman group	Lack of a clear policy supports for enhancing community resilience
Value addition of local mango and citrus	Request by community for government and local NGO support	Training of women farmers on value addition	Reliance on Government supervision and outside support
Marketing of local products and food culture	Income from inferior local products that do not have market earlier	Guaranteed access to market for local raw materials and value added products through diverse outlets	Quality maintenance Too much competition for similar products

Source: FGD, 2012

The GP requests government and local NGO support, as well as financial assistance for establishing processed fruits home industry in the community. The condition favouring the success of

this GP are by conducting training for women farmers on value addition, government extension services and subsidies, as well as analysis of value chain and capacity building of value chain actors.

The constraints of the success of this GP are reliance on government supervision and external support, and preference to few market demanded fruit cultivars that do not support diversity enhancement.

The GP is important to increase the income of low-grade products, which initially has no potential market. The condition favouring the success of this GP are guaranteed access to the market for local raw materials and value added products through diverse outlets (woman group stores, warung/grocery stores inside and a neighboring village, exports possibilities through NGO Support).

The constraints of the success of this GP are quality maintenance and much competition for similar products. The actions that has to be taken are:

- a. Community meeting to hold a dialog on the importance of maintaining local varieties of mango, market value of fresh and processed products of local varieties
- b. Developing a marketing system of fruit products through farmer group or association.
- c. Training on farmers to farmers to improve processing technology of mango and citrus. AIAT, University, and Agri-Extension Service supervise this training.

CONCLUSION

Fruit trees that belong to the communities are paramount for food security and source of income for households through marketing and processing activities. This system has confirmed by empowering women's group to improve processing and local market mangos and citrus products. The average incomes from TFT for the Household in the studied area are significantly necessary. The revenue contribution increased from 12%, become 51% for mango, and from 32% to 55% for citrus. The contribution of income can be increased when the farmers process the mango and citrus, then sell it by themselves. To overcome of cheap price of fruits in the harvest season and enhance processing activities, training on processing techniques of mango carried out by AIAT in cooperation with NGO for the women's groups.

The products are being sold in the local markets. Therefore, by having a market expansion with an efficient distribution process in the future through promotion efforts can increase the total consumers demand and marketing area. The practices can sustain the diversity of tropical fruit trees through empowered women group to get the added value from local varieties of mango and citrus by elevating the processing product and

enhancing group marketing.

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