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**Australian Centre for  
International Agricultural Research**

# Final report

*project*

## **The potential for rambutan in eastern Indonesia**

SADI-ACIAR research report

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**Australia Indonesia Partnership**

**Kemitraan Australia Indonesia**



## ACIAR's participation in the Australia–Indonesia Partnership

The Australia–Indonesia Partnership (AIP), comprising \$500 million in grants and \$500 million in highly concessional loans over five years, was announced in January 2005. The partnership supports Indonesia's reconstruction and development efforts, both in and beyond tsunami-affected areas. Assistance involves long-term sustained cooperation focused on economic and social development projects and Indonesia's programs of reform and democratisation.

ACIAR is committed to the partnership through the management of a component of the Smallholder Agribusiness Development Initiative (SADI), which aims to improve rural sector productivity and growth in four eastern provinces—East Nusa Tenggara, West Nusa Tenggara, South East Sulawesi and South Sulawesi.

This initiative will improve incomes and productivity for farmers and agribusiness in response to market opportunities, through a process that is underpinned by improved adaptive research and development capacity.

ACIAR's role in the initiative is to strengthen province-based agricultural research and development capacity that is market and client-driven, and effectively transfers knowledge to end users. A key part of this approach is delivered through market-driven adaptive projects which are priorities for smallholders, farmer groups, agribusiness, government and other supporting agencies.

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# 1 Acknowledgments

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## 2 Executive summary

Rambutans are grown throughout Indonesian, particularly in the wetter areas. Total production volume and number of farmers is less than mango and cashews with the domestic wet market the only outlet. Prices are still reasonable and farmers are in a reasonable sound economic situation.

Export opportunities need to be investigated in conjunction with exporters. Indonesia has a strong competitive advantage in export markets with out of season to the other major producers in Thailand and Malaysia.

A capability to develop access protocols and conduct appropriate dis-infestation protocols is required. In addition to the ability to access new markets, the development of pre and post harvest technologies to improve the percentage of high quality fruit to meet export requirements is essential.

Post harvest handling capability for export needs to be raised in terms of cool chains and packaging, using technology already developed in Australia and Thailand.

It may also be important to evaluate the use of paclobutrazol to extend the rambutan season earlier for both domestic and potential export markets.

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## 3 Introduction

This report is part of ACIAR's contribution to the Smallholder Agribusiness Development Initiative (SADI) in eastern Indonesia. The concept arose from a series of priority setting workshops.

The report takes a supply chain approach, looking at ways income could be increased for smallholders as part of a supply chain. The analysis operated from the position of researching issues in profitable sustainable supply chains, rather than an identification of technical constraints. There are many technical constraints. The only ones that matter are those that support profitable and sustainable supply chains. A number of project concepts were developed, identifying research required to make the supply chains work to the benefit of smallholders.

Analysis of the current situation operated from an understanding of the technical, marketing and economic issues faced by the crop. It rapidly became apparent that for some situations, it was difficult to improve incomes in the existing supply chain, despite many researchable problems. Adoption of improved technologies in this supply chain is unlikely, as margins are low for all in the chain.

Developing a new supply chain at a higher price, provides the market pull in terms of price for farmers and others to invest and adopt new technologies. Farmers will adopt new technologies where there is sufficient price pull. These benefits will spill over to existing supply chains e.g. if a farmer adopts new production systems to improve quality to meet high priced export markets, the portion of the crop sold into domestic markets also benefits from this technology.

The analysis also looks at the economic situation faced by a family farming enterprise, particularly in relation to the ability of the farm to generate sufficient revenue to maintain a standard of living similar to the rest of the population. It is a very high priority to generate economic wealth at least equal to the rest of the population and create an environment where incomes can increase with the rise of incomes in Indonesia.

Successful implementation requires strong involvement by all members of the supply chain as active participants in the research. These initiatives will fail if researchers proceed in the absence of input from as many participants in the supply chain as possible.

The results of the analysis arose from visits to farmers, government and private sector players in the three provinces as well as in other areas of Indonesia, where similar crops are grown. Visits were conducted over the 3 periods during February to June 2007. A series of project development workshops were held at the end of the consultancy to develop project concepts from the scoping mission. These included a wide range of participants.

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## 4 Current production

In NTB, rambutans are grown in the wetter areas around Mataram, Central and East Lombok. They are not grown on Sumbawa as it is too dry. Additionally, they are grown in the wetter areas of NTT, South and South East Sulawesi. South Sulawesi is interesting in that there are eco-climatic areas that could produce rambutans out of season to the rest of Indonesia. This is a significant opportunity.

The level of plantings and production in NTB is shown in Table 1.

Table 1: Rambutan production in NTB

	2005	2004	2003	2002	2001
<b>Tree Numbers</b>	159,800	107,455	207,751	231,815	107,642
<b>Production (tons)</b>	7,836	4,910	4,098	2,910	8,270

Trees are grafted varieties mostly one single variety. It appears to be a version of Binjai or Aceh, probably introduced many years ago as a seed than as propagated material. There appears to be only one variety grown in Lombok. Many regional varieties exist in Indonesia and each area believes their variety to be the best. There are a large number of rambutan varieties in Indonesia, Malaysia and Thailand. Australia has the best collection of all rambutan clones from all countries. Growers are very proud of their regional variety. There may be some benefit in looking at performance of a range of rambutan varieties for productivity, post harvest and consumer acceptance but the differences are not great. Australia is in the best position to supply a wide range of rambutan varieties. One key issue if an export sector develops is to find larger varieties with most fruit above 40 gram.

Rambutans are grown in areas of higher rainfall and are not drought tolerant. Rainfall distribution is important to rambutan production as trees are not irrigated. Production is located in areas with a short dry season around Mataram and central Lombok. Farmers in these areas have a greater security of cropping and a wider range of crops they can grow than the drier areas of east Indonesia.

Farm size is small with the largest farms 1 ha (150 trees).

## 5 Production technology

There are little or no inputs other than the grafted variety, and minimal management in the establishment phase with a small amount of fertiliser used. The site has a big influence on production. Soil types in the production area are characterised by very good levels of available nutrition (Table 2).

Table 2: Soil analysis at Batu Mekar in NTB

Site	% N	% P	% K	% Na	% Ca	% Mg
1	1.2	0.11	0.64	0.06	1.10	0.23
2	1.2	0.16	0.86	0.08	0.96	0.23
3	1.2	0.04	0.60	0.06	1.19	0.23
4	1.1	0.05	0.57	0.07	1.31	0.21

There were some trees of rambutan in the drier areas of north Lombok around houses that are irrigated. It is interesting to note these trees are significantly earlier than normal production areas. There are always big financial and marketing benefits of earliness in horticulture, even in Indonesia. For rambutan farmers who can produce earlier for the Mataram market, (under irrigation in the drier northern areas of Lombok), prices are as high as Rp4 000/kg compared to Rp2 500 in the middle of the season

There are ants and mealy bugs present at harvest that are an issue for exporting. There is virtually no chemical use, other than maybe glyphosate for weed control. Large fruit size for export is an issue and this is related to variety, nutrition, crop load and irrigation.

## 6 Current market situation

All sales are into the local market with some sold to the drier eastern areas. There is no timing advantage for NTB over the other areas of Bali, Java and Sumatra. There are some imports from Bali early in the season at a higher price. Local market prices are around Rp4 000 - 7 000/kg with farmers receiving around 2,000-Rp2 500/kg.

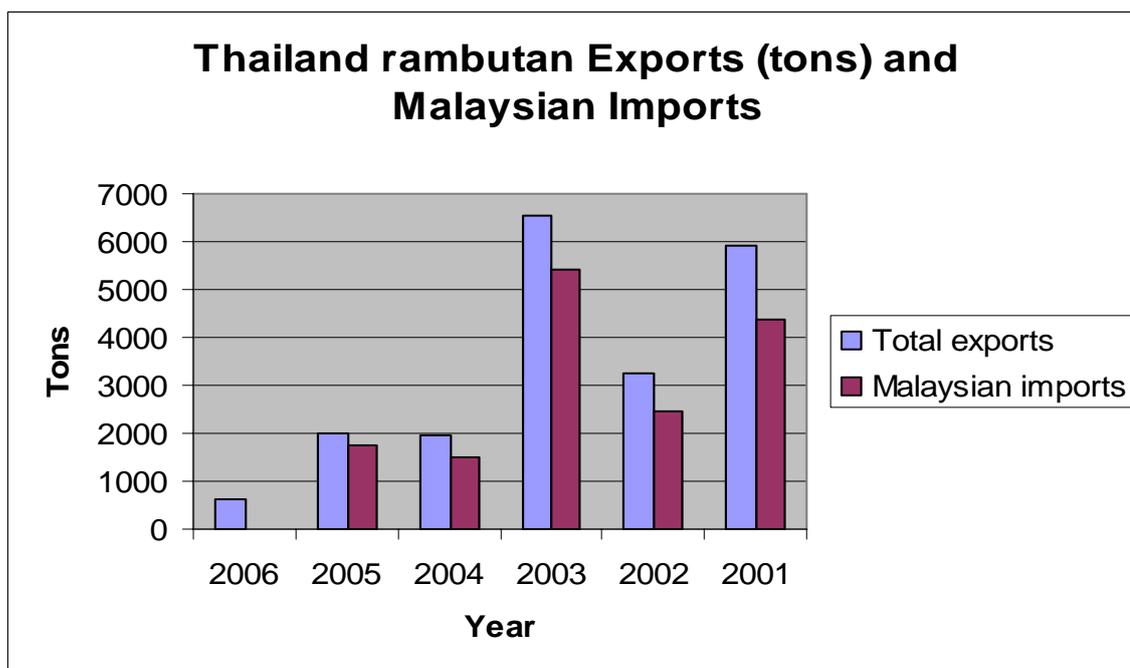
There is no post harvest cool chain or use of any significant intervention. Product is sold quickly minimising deterioration.

Fruit are often sold by the farmer on the tree to a collector who harvests the fruit. Farmers receive less as a result but the farmer may have another permanent job, using the rambutans to supplement income. One farmer with 35 trees (one quarter of a hectare) sold his crop on the tree to a collector for around Rp1.5 million, which equals around Rp6 million/ha.

Other farmers indicated they were paid around Rp2000 /kg. Trees produced around 100-150 kg/tree at a spacing of 8m x 8m (150 trees /ha). This gives a total sale income of around Rp30-40 million /ha. This is from virtually no inputs other than weed control and harvest, approximately 2-3 months work for the family. Fertiliser use is small as soils are good. Organic manure is often used once per year at minimal cost. This is a good family income for the amount of work required.

There are no exports from Indonesia. Thai exports (Figure 1) have declined from around 6,000 ton to less than 1,000 ton in 2006. Almost all were sent to Malaysia. This market has collapsed severely impacting Thai rambutan exports. It is believed the collapse of the Malaysian market is due to high residues of insecticides used to control fruit borers. Rambutans are opened with the teeth so residues on the skin are significant (like strawberries in Australia that require a much higher level of food safety than fruit where the skin is not eaten).

Figure 1: Tonnage of Thai rambutan exports, and the quantity of exports to Malaysia



Source: Thailand Customs Export Statistics [www.customs.go.th](http://www.customs.go.th)

Small quantities of Thai rambutans are sent to China and Hong Kong (50-100 ton), UAE (50-200 ton), Taiwan was a market but exports appear to have ceased. Quantities sold into the EEC are very low, mostly to Switzerland, Netherlands and UK. Korea has recently emerged as a market with 150 ton imported in 2006. Very small quantities of Thai rambutans have been exported to Indonesia (7 ton in 2006) probably to supermarkets.

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## 7 Future prospects

It seems difficult to intervene successfully in the current local trade. Local rambutans in season are cheap at around Rp5 000/kg in the markets (Rp2 000-2 500 to the farmer). There are some production and quality issues that could be researched, but in the absence of a better price pull it is difficult to see significant adoption.

The issue of earlier production is interesting to pursue. One farmer in the dry areas of north Lombok was able to sell early rambutan locally at a very high price because they flowered earlier in response to irrigation. Paclobutrazol is also registered in Indonesia for use on rambutan. In Australia it does move production earlier but this is not a big benefit. In NTB, earliness would be a considerable benefit. NTB imports early season rambutan from Bali at very high prices. Clearly there is a benefit to local farmers that could be realised with a small amount of research. Farmers were not aware of this role for paclobutrazol.

One issue that will emerge across all of horticulture is the food safety issue. Indonesian farmers and institutions are not prepared for the introduction of a food safety within the country. Rambutans will be the first crop affected as they will have a higher food safety requirement than others because the skin enters the mouth to open.

While farmers do not appear to use any chemicals, it is possible that the central government will follow international trends and force a national food safety program. This may come sooner than many think due to the increasing pressure from the rapidly increasing supermarket sector. This sector has to operate with good food safety due to its duty of care. All the international players in this sector are familiar with food safety as part of their business and part of their supplier requirements. They may force a national food safety strategy.

The key issue for Indonesia is can it develop an export market for rambutans? Selling a small proportion of the crop to the higher priced export sector has big spin off benefits for domestic supply, and is a platform for introduction of better technology across the whole for production, as better technology required for export will also be used for domestic supply.

The Thailand export experience with rambutans is not as good as for mangosteens, probably reflecting the difficulty of getting the post harvest issues resolved. Rambutans require cool storage from picking, packaging in MAP (Modified Atmosphere Packaging) bags to prevent spintern browning, and air freight.

One issue for export to some markets is that generally only larger fruit are sold. This means taking individual larger fruit from the bunch and packing individual fruit in plastic bags. This is a different style of marketing and will require some changes in handling logistics from the current system.

Developing export opportunities for rambutan will require:

- An analysis of the technical, economic and marketing issues in a number of potential markets.
- Identifying quarantine access issues including dis-infestation research
- Cool chain investment from the farm.
- Packaging systems to minimise skin browning.
- Harvest systems that minimise damage to spinterns.
- Grading specifications to meet specifications for export.
- Research to increase the % meeting export standards for size and quality.

Initial market focus will be on easy to access, non-phyto markets. This could follow the Thai example. It is possible that an opportunity exists in Malaysia and Singapore, considering the exit of Thai rambutans and the season in Indonesia is Nov-Dec compared to Malaysian and Thai season of June – July. The increasing supermarket sector in both these countries is clearly a target for a higher priced out of season product.

Entry into the Arab States, EEC countries, and possibly Canada is not under any quarantine requirement. Thailand sells around 100 ton /year into the UAE, and smaller quantities into a number of European countries. All of this has to be air flown so will be expensive. All of these markets are not familiar with rambutans. Given the cost of air freight to Europe (+US\$3/kg), it is likely that all will be small markets demanding very high quality for a high priced product.

For all of north Asia – China, Taiwan, Korea and Japan, access issues will need to be resolved, though fruit could be exported to Hong Kong with no entry requirement.