

# Life Transformation Through Global Tree Nuts: A Case Of Macadamia Nuts Producing Farmers In Zimbabwe.

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**Abstract:** Macadamia nuts were an important commodity among the Aborigines society in Australia where they originated. The nuts found use in medicine, food, cosmetics and gifts at feasting inter-tribal ceremonies. Due to their impact on the lives of the ordinary men, the macadamias were then commercialized around 1930s in Hawaii. While Zimbabwe now boast of vast orchards of macadamias after their introduction in 1965, their contribution to the life of the ordinary Zimbabwean farmer is not known. As a result, this paper sort to empirically, investigate the impact of macadamia nuts farming on the lives of farmers in Zimbabwe so that the government and individuals who intend to consider growing the crop make an informed decision. Data set captured from 128 macadamia farmers through a questionnaire was used in the study. Proceeds realized from macadamia nut orchards have enabled the majority of farmers to prepare a better future for their children, adequately provide food for the family, build decent homes, afford to pay family policies, plough back in the orchards through infrastructure development and reinvest in other income generating projects. This study concludes that macadamia nuts farming is very sustainable and has proved to be a game changer in the lives of the ordinary farmers in Zimbabwe. The study thus recommend government to improve its support for the sector and to encourage farmers to invest money realized from macadamia nuts in order to have a fallback position.

**Key words:** Transformation; Investment; Macadamia nuts; Consumption; Sustainability.

## 1. Introduction

Macadamia nuts are a member of the tree nut family, which are edible fruits that possesses a hard outer core [24]. It is a newly established venture in the global tree nut industry growing at an alarming rate as shown by its increasing demand [20]. Macadamia nuts originated in the Australian coastal rain forestry of Northern New South Wales and Southern Queensland [7]. Aborigines who were settlers on the North-Eastern slope of Australia's Great Diverging Range were the first to consume macadamia nuts, which they called Kindal Kindal among other names like Bombera, Jindill or Baupa. In the Aborigines society, macadamia nuts were an important commodity used as gifts at inter-tribal corroborees. It was the role of women to harvest the nuts in coolamons or dilly bags, remove husk and crack shells before taking them to feasting grounds. Aborigines also extracted oil from macadamia nuts that was used as binder with ochres and clay for both body and face painting. The oil was for renewing skin and when mixed with other plants extracts it would treat

ailments [2]. Breast feeding mothers were encouraged to consume the bitter macadamia nuts about to germinate to improve milk production [15]. Macadamia nuts trees were named after John MacAdams a scientist and secretary of the Philosophical Institute of Australia [15]. Although macadamias originated in Australia, the industry established first in Hawaii in the 1930's [21]. There are four species of macadamias, namely macadamia intergrifolia, macadamia tetraphylla, macadamia ternifolia and M Jansen. Only macadamia intergrifolia and macadamia tetraphylla are species for commercial purposes. Hybridization takes place between any two of the four species to create varieties suitable for a climatic condition [15].

### 1.1 Statement of the problem

Macadamia nuts were introduced in Zimbabwe in 1965 where they were only grown by commercial farmers who were concentrated in Chipinge district. In 2000, the government initiated the land reform programme and this

marked the entrance of another group of farmers called A1 and A2 farmers into serious farming business. The new farmers were mostly specializing in tea and coffee as the main cash crop which they later abandoned for macadamia nuts. Macadamia nuts orchards have now spread to other districts and provinces with more farmers taking macadamia nuts as their number one cash crop. Thus, macadamia nuts are now a unique crop in Zimbabwe though they are marketed at very low prices compared to regional, European and Asian prices. One wonders why there is this influx of new farmers and rapid expansion across the country into the macadamia nuts industry. This research will therefore assess the tangible benefits realized by macadamia nuts farmers in Zimbabwe which somehow act as pull factors to other farmers and how this can enhance achievement of the government's NDS1 (2021-2025, targeting a middle income for all by 2030).

## 1.2 Main Objectives of the study

- To examine the impact of macadamia nuts on the lives of macadamia nuts farmers in Zimbabwe.

### 1.2.1 Sub objectives

- To raise awareness to farmers in Zimbabwe of the need to invest proceeds realized from macadamia nuts.
- To highlight some of the innovations and successes arising from macadamia nuts farmers in Zimbabwe.
- To check the sustainability of macadamia nuts as a cash crop in Zimbabwe.

## 1.3 Conceptual framework

The study conceptualizes that agriculture is one important driver of economic growth in most countries and is the main foundation of human life being. It is very critical to development and hence enhancing the efficiency and productivity in the agriculture sector has a positive effect in minimizing poverty. In most cases, farmers tend to have a main cash crop, which generates income for the family. Macadamia farming in Chipinge and Chimanimani districts of Zimbabwe is one such crop, which has replaced other crops as the main cash crop. This replacement means the farmers have observed that the crop is giving them some benefits which is better when compared with other crops. This study thus investigates why the crop is now the preferred cash crop for farmers by exposing benefits derived by the farmers. The fact that the crop is now most farmers' preferred cash crop means they are realizing and experiencing an improved lifestyle.

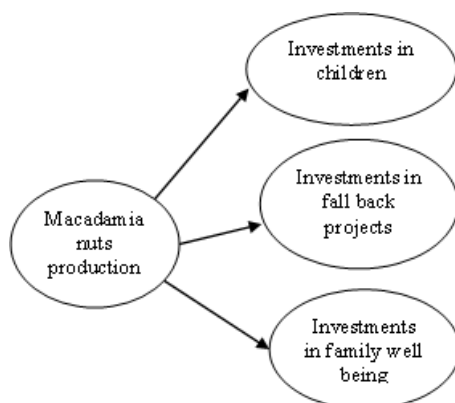


Figure 1: Conceptual framework

## 1.4 Scope of the study

The study examined how macadamia nuts production has changed the lives of people in Zimbabwe with reference to Chipinge and Chimanimani districts. The assessment involved checking progress made to date by individual macadamia nuts farmers starting from the year 2000 to 2021.

## 1.5 Description of the study area

The research study was conducted in Chipinge and Chimanimani districts of Manicaland province in Zimbabwe. Manicaland Province is located to the east of the country's capital Harare. Its provincial capital Mutare is 264km from Harare, which in turn is 188.4km from Chipinge district to its south. Chimanimani district on the other hand is located 143km to the south of Mutare. Chipinge and Chimanimani districts are the main macadamia growing areas in Zimbabwe with over 5000ha under macadamia nuts.

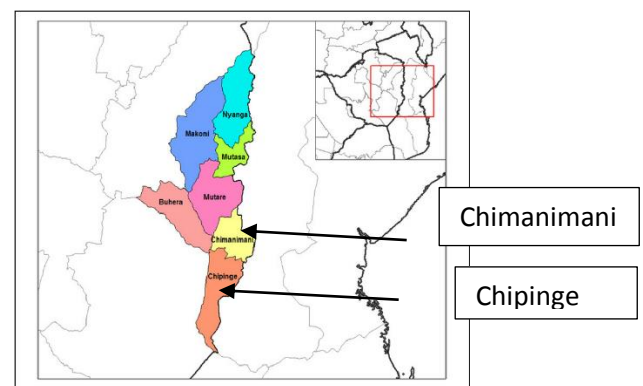


Figure 2: Map showing study area

## 2. Macadamia nuts farming

### 2.1 Macadamia nuts requirements and production

Macadamia trees produce maximum yields in tropical or subtropical climatic regions with temperatures of 16-25 degrees Celsius [6]. The tree needs well-drained soils, rich in organic matter with good drainage and pH range of 5.0-6.5. Macadamia nuts grow on different soils with different chemical compositions hence the need for fertilizer to ensure adequate nutrients [12]. The macadamia nuts orchards also perform better in rocky lava soils provided they get adequate fertilizers [17]. In order to perform better, the plantations require about 1000mm/year of rainfall uniformly distributed. Over 150 pests attack macadamia nuts in their country of origin [19]. Integrated Pest Management (IPM) approach is therefore essential to deal with pest. The method, which may be cultural, physical, biological or chemical allows farmers to deal with pest population safely [11]. In order to improve yields, farmers are encouraged to keep one beehive per every acre of macadamia nuts and therefore spray needs monitoring to avoid killing the bees during flowering stage [21]. The biggest macadamia nuts producers are South Africa and Australia who together produce 53.6% of the world's annual macadamia nuts production. Other notable producers in order of their importance are Kenya, USA, Guatemala, Brazil, Malawi, Vietnam, China, New Zealand and Swaziland [5]. In Africa, Malawi, Swaziland,

Mozambique and Zimbabwe are among the producers of macadamia nuts [8]. Harvesting and flowering of macadamia nuts takes several months and because of that, the production processes taking place in different places overlap. In Africa and Hawaii, harvesting of macadamia nuts is done when its winter in Europe whereas Australia and Central South America harvest macadamia nuts in summer and spring seasons [22].

## 2.2. Marketing of macadamia nuts

Macadamia nuts are marketed using two main codes (1) 080261 for in shell macadamia nuts and (ii) 080262 for kernels or shelled macadamia nuts. In developing countries, the macadamia nuts are primarily for export [3]. About 95% of the world's produced macadamia nuts are for export to mainly China, Vietnam, USA, Japan, German and Canada constitute the world's biggest consumers [26]. Current records show that Europe is now the second biggest importer of macadamia nuts with a 30% share of the world macadamia nuts imports [22].

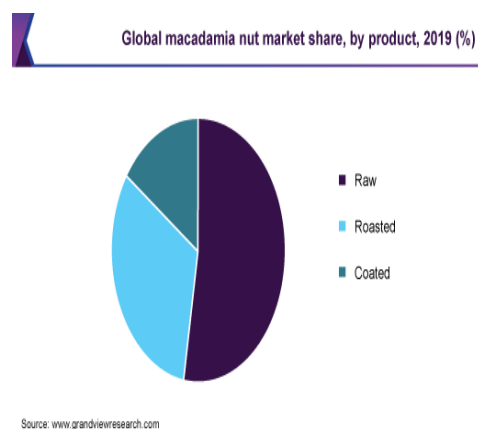


**Fig 3:** macadamia nuts market rating.

## 2.3 Consumption of macadamia nuts

Macadamia nuts and its products are now widely used in the food, beverage, cosmetic and personal care industries and this has positively influenced their global markets [31]. The Nuts and its products are highly regarded by consumer courtesy of their flavor, versatility and crunchy texture over and above the fact that they have a healthy nutrition value. Healthy experts encourage the nuts to be included in consumer's meals once a day [10]. Macadamia nuts' healthy benefit comes from the fact that the nuts are purely a natural plant with no cholesterol and this lower down chances of heart diseases [13]. The kernel contains proteins, carbohydrate, vitamin B1, B2, E, Fibre, calcium, phosphorous, magnesium, iron, potassium and niacin [28]. Consumption of macadamia nuts differ from country to country. In Australia, United States of America and Japan, macadamia nuts are preferred as ingredients whereas in Europe they want them as snacks [22]. is the main importer and consumer of macadamia nuts with an estimated consumption range of 8,800-9,800 metric tons per year. China produces more than what it consumes and is the second main consumer of macadamia nuts products although its consumption vary year after year with peak consumption of 5,843 metric tons recorded in 2013. Australia is among the biggest producers of macadamia nuts at 12,760 metric tons annually and an exporter with a consumption averaging 3,347 metric tons [14]. In Europe, annual macadamia nuts consumption was 600t in 2018

and was expected to increase at 10% every year. Germany, Spain, Netherlands and United Kingdom are the biggest consumers in Europe. Macadamia kernels produced in developing countries i.e. in Malawi, macadamia nuts are primarily for industrial purpose and consumption is minimum [26].



**Fig 4:** Global macadamia nuts market share by product

The demand for macadamia nuts and its products outweighs its supply [9]. Prices charged by retailers and wholesalers is dependent on the supply of the nuts by farmers, demand by consumers for luxury macadamia products and the brands of the firms [25]. Macadamia nuts and its products are sold at very high price in European countries i.e. 50% and six times more expensive than cashew nuts and peanuts because they are considered as luxurious. This increases their value when compared to volume [22].

## 2.4 Macadamia nuts in Zimbabwe

In Zimbabwe establishments of macadamia nuts was led by Ted Tonks, Arther and Anne lane in 1965 who imported seedling material from Australia and California [23]. The macadamia plantations are common in Chipinge district of Manicaland province and are now expanding to other districts i.e. Chimanimani, Mutare, Nyanga, Mutasa and other provinces like Mashonaland East, Mashonaland West and Masvingo [16]. Smallholder farmers and large-scale farmers are both into macadamia nuts production [27]. In the Eastern highlands of the country, macadamia nuts, plantations have replaced coffee and tea whose prices on the market fell [16]. Currently, the biggest producer of macadamia nuts in Zimbabwe is Ariston holdings [1]. In 2012, Zimbabwe was among the five biggest exporters of macadamia nuts (4.5% share of the market) together with USA, Hong Kong, South Africa and Australia [4]. Zimbabwe used to deal with exports markets outlets from Canada, Europe and Australia, but this has since changed due to land disputes leaving the country relying on Asian and South African markets [23], [29]. Zimbabwe has potential to produce around 8-12t per ha if best management practice is put on the orchard [29]. Macadamia production and expansion in Zimbabwe is affected by the high cost of seedlings, lack of irrigation infrastructure, poor storage facilities and lack of research on best varieties for the country [18]. The small-scale macadamia farmers sell their macadamia nuts to intermediaries who do not give them value for money on

their nuts [30]. Foreign companies buy macadamia nuts at very low prices of around USD1.50 –USD2/kg and export them to countries like China where they are given better prices.

### 3. Material and methods

The study collected primary data on macadamia nuts at fixed areas using a 156 questionnaire. The target population were individual macadamia farmers who were either A1 or A2 farmers. The study employed random-sampling method on farmers. In order to target the correct respondents, the researcher approached Agritex (Agriculture Research and Extension), AMA (Agriculture Marketing Authority) and Macadamia Association of Zimbabwe to get the list of macadamia farmers. The questionnaire had section A for personal information and section B for information on investments done by farmers using proceeds from macadamia nuts farming.

### 4. Results and discussion

#### 4.1 Socio-economic results

A total of 156 macadamia nuts farmers in Chipinge and Chimanimani district of Manicaland province received the survey questionnaire and only 128 farmers responded (82%). Most of the respondents were registered with AMA (92.7%) with age ranging from 30 – 68 years and having an average family size of 4. About 108 (84.4%) participants were in possession of at least a secondary education and therefore getting useful information for the research was easy. Only 6% of the participants were single, 91% were married and 2% were widows. The results also show that 82.5% of the farmers were men whilst 17.5% were women farmers. This proves that different people grow macadamia nuts in Zimbabwe.

#### 4.2 Farming and innovations results

The macadamia farmers had different plot sizes ranging from farmers with less than 1ha to above 10ha. This means the survey included both A1 and A2 farmers (Fig 5 below). However, indications from the outcome are that most of the macadamia nuts farmers are A1 farmers (79.2%) and a few are A2 (20.8%). As shown by Fig 6, production yield by the different farmers also reflected mixed results with 46.9% of the farmers producing less than 2t/ha, 42.7% getting between 2-3t/ha and only 10.4% producing above 3t/ha.

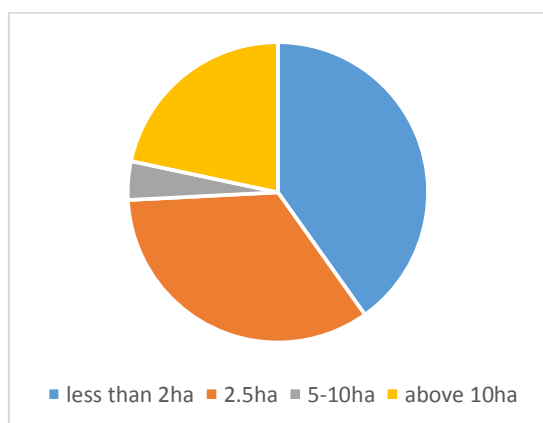


Fig 5: Farmers' plot sizes

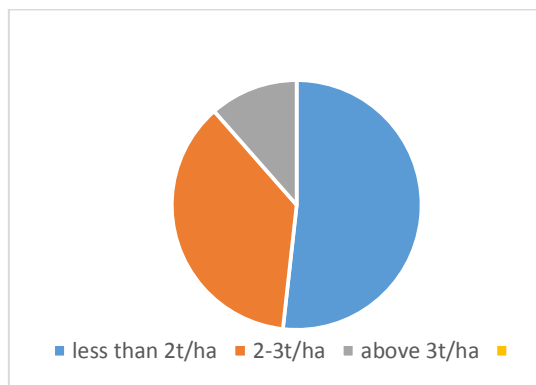


Fig 6: Farmers' yield per hectare

The majority farmers (66.4%) rely on own money to finance the next farming operations. However, of the 33.6% of the farmers who get assistance from outsiders, 86.2% only get 30-50% of their total requirement for the season. The fact that most of these macadamia nuts farmers self-finance themselves is an indication that they are getting good returns which are later ploughed back in the field. This shows that there is sustainability in the macadamia nuts farming in Zimbabwe. All macadamia nuts farmers in Zimbabwe grow macadamia nuts as an industrial crop which is sold to buyers who in turn export to foreign countries. However, some farmers have indicated that they do value addition on a very small-scale to improve income realized from the nuts considering the low prices that buyers offer to farmers. A total of 3.7% of the farmers crack nuts that are not suitable for export purposes for domestic use and market. The kernels are roasted, salted and packed in 50g packets for marketing on open markets or are used to produce macadamia butter for family use. This innovation move is helpful in the since that the farmers end up recouping income from the rejected nuts.

#### 4.4 Investment in children

The result (fig 7 below) shows that most of the macadamia farmers managed to invest in their children through sending them to school. The research outcome shows that 11.9% of the famers were able to educate their children up to secondary education level, 29.2% of the farmers educated their children up to college level and 58.4% of the farmers managed to pay fees for their children up to university level. This investment in education is dependent on the parents having enough resources at his/her disposal to pay fees, which are exorbitant at higher and tertiary education. The fact that most of the farmers afforded to pay these fees means that the macadamia nuts farming can give a better margin to the farmers.



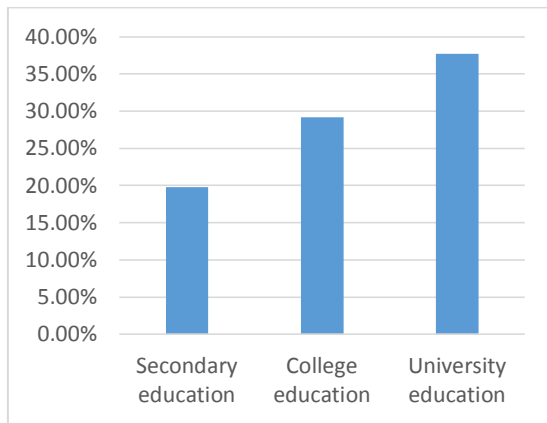


Fig 7: Graph showing education levels attained by farmers' children

#### 4.5 Investments in other lines of business

About 57,2% of the farmers ploughed back proceeds from the macadamia orchards through infrastructure development such as fencing, borehole drilling or installation of irrigation facilities. The results also indicate that 33.1% of the farmers invested in machinery for use on the farm and for hiring out i.e. tractors, disk plough and dehusker. Conversion of proceeds into capital expenditure goods for use in the orchards and for hiring out to generate additional income for the farmer can only be done if there is a reasonable income coming from the field because working capital is number one priority. A fallback position is very necessary in the event of a misfortune in the macadamia farming business. In the agriculture industry, the farmers also diversified the farming to include livestock (77.5%) with some farmers investing in four different types of livestock (cattle, goats, sheep, pigs and broilers). The research revealed that 39.6% of the farmers invested in other businesses outside agriculture to augment their income from the farm and to have an alternative source of income outside farming. The investments were done in the form of properties in town, transport and retail businesses.

#### 4.6 Investment in family welfare

Family welfare is one of the primary reasons why people engage in agricultural activities. The welfare of the family covers measurable things like food, healthy, good accommodation and life policies. Indications from the research are that 93.8% of the macadamia farmers have invested in descent accommodation for the family in town, in farms or in rural areas and 47.9% of these houses are connected to electricity from the main grid or solar energy (2.0%). Most houses are equipped with properties to ensure comfort and entertainment to the family. About 93.2% of the houses were equipped with more than two different household properties and 6.8% equipped with two different properties. Over half the macadamia nuts farmers (55.9%) were in possession of a family vehicle. An analysis on macadamia nuts farmers shows that 96.9% of the farmers afforded three meals a day and 3.1% afforded breakfast and dinner only (shown on Fig 8). The fact that the majority of macadamia nuts farmers' family are having three meals per day under the current economic hardships in Zimbabwe means the farming business has greatly improved their lives.

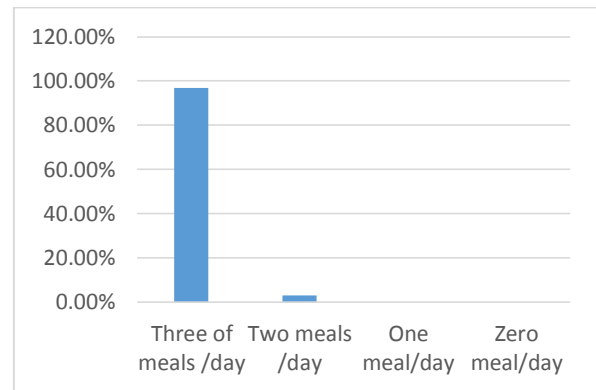


Fig 8: Graph showing number of meals/farmers

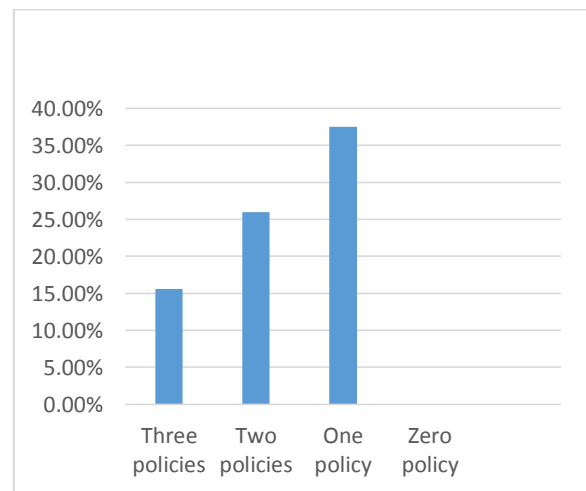


Fig 9: Graph showing farmers policies

As shown (fig 9) above, 15.6% of the macadamia farmers could afford to pay premiums for three policies, 26.0% had two policies and 37,5% had one policy. Thus, a total of 79.1% of the macadamia nuts farmers had at least a policy for the family. In Zimbabwe, policies are very expensive and the fact that a greater number of the farmers can afford to pay these policies means they are getting a good return from their main cash crop. Only 20.9% of the farmers had no policies and this may be due to very low yields which are below 2t/ha, or they are not aware of their importance hence the need to have an awareness campaign.

## 5. Conclusion and Recommendations

### 5.1 Conclusion

Empirical evidence from the analyzed results indicate that macadamia nuts is now an important cash crop for farmers in Zimbabwe. As seen from the results, macadamia farmers get adequate income from the orchards, which enable them to invest in their children's education some at higher level, to provide the family needs and build decent electrified homes with comfort and entertainment. Some farmers have even managed to invest in different income making projects, in the form of properties in town, shops and in transport business. The study therefore ascertains that macadamia nuts farming is an important game changer in the life of the farmer in Zimbabwe. Today, most macadamia nuts farmers in Zimbabwe are now

leading a completely changed life because they chose macadamia nuts as their main cash crop.

## 5.2 Recommendations

This study recommends Government support the macadamia sector, which has demonstrated to be one of the important agriculture industries in the country with capacity to change the lives of many people. This can be done through channeling resources to the sector that enable improve in quality and quantity of nuts produced i.e. input supply scheme, training of extension officers, promoting research to have new varieties, facilitation of backyard processing industries. This will go a long way in convincing farmers to join macadamia nuts industry or expand their orchards. Macadamia nuts have potential to reduce poverty, malnutrition and build wealth for the family. This may provide homegrown solutions for the Government to meet its vision 2030 (Towards upper middle income for all) as planned. Zimbabwe experiences the common hazards due to tropical cyclones, which cause very high rainfall with thunderstorm leading to hailstorm, floods and flash floods. In some instances, the country witness dry spells and droughts that may run for one to three years and is a result of the EL Nino Southern Oscillation (ENSO), which starts from the Pacific Ocean. Zimbabwe together with other Southern African nations, Malawi and Mozambique experienced the worst cyclone in 2019. The storm named Cyclone IDAI was moving at a speed of 105Mph and it destroyed properties, animals, crops and caused loss of life. All these hazards are a danger to macadamias and so it is very vital that farmers be encouraged to invest the proceeds they realize from macadamia nuts in order to have a fallback position in the event of a poor season or fall in demand of the nuts.

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