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## **Factors Influencing the Growth of the Floriculture Industry in the Monsoonal Tropics of the Northern Territory, Australia**

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**Keywords:** competition, density, fragmentation, Indigenous, remote

### **Abstract**

Floriculture has been proposed as an ideal basis for sustainable enterprise development for resource-poor communities in the Pacific Islands, Papua New Guinea and northern Australia. World trade in floricultural products continues to increase in some countries and there are recognised market opportunities for floriculture based on the rich plant biodiversity of the Pacific and Australian region. The Australian Centre for International Research (ACIAR) has funded two reviews to highlight specific floricultural opportunities and identify constraints and opportunities in the use of native floriculture to improve the livelihoods of Indigenous communities in Australia, Papua New Guinea and the Pacific Islands. This paper will present the findings of these reviews in the monsoonal tropics of the Northern Territory. This objective was achieved through interviews with a variety of stakeholder groups involved in floriculture, a desk top analysis of the factors influencing Indigenous participation and a case study investigating the value chains of cycad fronds. Our initial results indicate that low population density, low consumer demand and competition from imports all limit local and regional market demand for floricultural products. Remoteness and consequent high transport costs also adversely impacts market competitiveness. Indigenous participation in this industry is further compromised by a complex array of cultural, logistical and social factors that not only limit their involvement in conventional floriculture, but also influence the economic feasibility of wild harvested products. Despite these obstacles, some growers of exotic tropical species in northern Australia have managed to compete in southern Australian markets. This paper will outline the factors that influence participation and growth in the floriculture industry in the Northern Territory and will suggest research and development opportunities to improve the growth of this industry.

## INTRODUCTION

Floriculture in the Northern Territory (NT) of Australia is largely limited to the cut-flower industry which, despite receiving three decades of Government research and support, is still very small scale, vulnerable and not very diverse. This paper examines steps that have been taken to grow floriculture in the NT and draws out key factors impacting on the uptake and success of this industry. It will also focus on cultural and social factors that impact on Indigenous involvement in this industry.

The NT is a vast area of 1,420,970 km<sup>2</sup> with a high diversity of habitats ranging from rainforests, mangrove forests, swamps and wetlands in the monsoonal tropics of the north through to the hummock grasslands and mulga shrub lands of the desert areas in the south. These landscapes are relatively intact and undeveloped, with a very low population density of 0.17 person/km<sup>2</sup> as compared to the rest of Australia (2.8 person/km<sup>2</sup>). The population of 211,944 people (Australian Bureau of Statistics 2011) is mostly situated in the two largest cities, Darwin and Alice Springs, but there are many smaller, more sparsely populated remote townships and Aboriginal outstations (a settlement on an Aboriginal clan estate). The tenure of the NT is dominated by Aboriginal land (~50%) and pastoral leases (~48%), with only a very small amount classified as National Park. However, large sections of Aboriginal land are classed as Indigenous Protected Areas and are therefore part of the National Reserve System (Australian Government 2014). Aboriginal people make up roughly one third of the population of the NT and approximately 70% of the Aboriginal population live remotely. Many of these remote Aboriginal communities suffer from high levels of unemployment and welfare dependency, with few options for economic development (Altman, 2005).

Aboriginal people in the NT have limited options for employment and economic development, but commercial trade of natural resources provides opportunity in an area which they have knowledge and affiliation (Walsh and Douglas, 2011; NTG, 2009; Altman, 2005; Pearson and Gorman, 2010, Gorman et al., 2006). Such natural products include those that have been harvested as Aboriginal customary food, medicine and a variety of other plant products, many of which would fall into the category of floriculture. These commercial opportunities can significantly improve livelihoods for Aboriginal people wanting to generate income from their natural resources, but are currently fairly limited in their uptake and this paper will explore the reasons for this.

The NT Government's Primary Industry Division delivers strategic services to support profitable and sustainable primary production. Within this Division is the Department of Primary Industry and Fisheries (DPIF) that works in partnership with producers, industry bodies, community groups and other agencies to promote growth and access markets for primary products (NTG, 2014). Since the late 1980s, this Department has been supporting the floriculture industry, principally the plant nursery and cut-flower sectors, through targeted research and development, extension, marketing and pest, disease and chemical diagnostics services.

In the first 10 years of the cut-flower industry (late 1980s to 1990s) there was a reported rapid uptake by cut-flower growers and the value of this section of the floriculture industry was put at around AUS\$3 million. In 1997, a NT Cut Flower Growers Group was formed which worked with DPIF to develop an action plan for the industry (Sullivan, 1997). Despite this initial rapid growth of the cut-flower industry and many years of NT Government support, there has been very limited continued growth in this area and little engagement and incorporation of Indigenous people. The NT Cut Flowers Group ceased to function in 2013 and the numbers of growers has reduced in

recent years leaving the industry fragmented. This paper reflects on the factors that have contributed to this trend and suggests recommendations to try and improve the uptake and success of this industry.

## **MATERIALS AND METHODS**

The methods used in this study include desktop research, survey, workshop/onsite interviews and analysis of value chains for bush harvested floriculture product. To achieve the context and current state of the floricultural industry in the NT a review of its history, the extension and support services, and the supply chain issues that impact upon the sustainability of the industry was undertaken.

The current state of the cut-flower industry in the NT was determined in four ways. Firstly, through liaising with staff at DPIF who supplied us with historical fluctuations in cut-flower grower numbers and key industry issues in addition to information about the shifting emphasis with their extension and research roles in the past decade. DPIF have produced a number of fact sheets and reports on a diversity of research and development areas associated with the floriculture industry dating back to the late 1980s (NTG 2014). This was useful historical information which gave clarity to industry development and also what advice and extension was being provided over time.

Secondly, questionnaire surveys, workshops and on-site interviews were carried out in order to derive some basic information from different stakeholders currently involved in the floriculture industry. Four different groups were sent survey forms: growers/wholesalers/retailers, florists, nurseries and Indigenous community members. Some stakeholders were also phoned for informal semi-structured telephonic interviews.

Thirdly, semi-structured interviews in a workshop and face-to-face visits were conducted. The interest of the cut-flower growers/wholesalers and retailers in attending a workshop was gauged through the survey forms and this was followed through with a phone call. This workshop was held at Charles Darwin University on the afternoon of 29 January 2014. The purpose was to get a greater depth of information from growers about the issues and possible solutions affecting their operations. One of the main growers was unable to attend this workshop and so we visited in person to go through these questions and gain greater insight by seeing the property. A site visit was made to an Aboriginal Community to discuss floriculture as a livelihood option for this community and to find out what the history of horticulture and floriculture had been in this community and what some of the opportunities and barriers might be to this happening in the future. We visited the Indigenous Ranger Group and talked to the Ranger Coordinator as well one of the Traditional Owners. This information about Indigenous involvement was supplemented by literature from similar studies (Nikolakis 2010; Gorman et al., 2006).

Fourthly, understanding the value chains of a bush harvested floriculture product harvested by Aboriginal people was sought in order to test the commercial market. In order to determine the feasibility of harvesting and supply of bush harvested floricultural products value chains of *Cycas armstrongii* fronds, a potential 'filler' product, were researched under the ACIAR funded project titled, "Strategies for using floriculture to improve livelihoods in Indigenous Australian and Pacific Island communities". Aboriginal Bush Traders (ABT), a non-for-profit, Indigenous community based initiative, in conjunction with DPIF, conducted research to assist in developing protocols for the harvest and post-harvest handling of cycad fronds and to develop and implement a working model of the value chains for other bush-harvested floricultural products. An important aspect of these trials involved local Aboriginal women walking the chain and

visiting local and interstate members in the chain and their operations. Additionally, an alternative interstate value chain was 'walked' through a large local flower grower and consolidator of NT floricultural products who had established businesses with several interstate floricultural wholesalers in Sydney, Adelaide and Melbourne.

## **RESULTS**

The categories of floriculture most active in the Northern Territory included cultivation of exotic tropical species for the cut-flower industry, cultivation of native and exotic plants in nurseries for commercial and retail sale, harvest of grass seed and native plant seed for revegetation projects, cultivation and wild harvest of different native plant products for a variety of commercial purposes through to cultivation and wild harvest of whole plants, such as cycad and bamboo, for local, national and international sale.

The NT Government's DPIF has provided a fairly extensive research and development (R&D) program since the late 1980s (NTG 2014). This has included development of new varieties of cut-flowers, research into cost benefits of different transport options and an extension role in giving growing advice, market trends, and encouraging industry growth. In more recent time the R&D focus has been in topical exotics such as *Heliconia*, *Etilingera*, *Alpinia*, *Zingiber*, *Curcuma* and various orchids in the monsoonal tropics of the NT. In more arid southern NT, the focus has been on developing commercial production of well-known Western Australian native species, such as *Anigozanthos* (Kangaroo Paw). The capacity of DPIF to provide R&D for the cut-flower industry has waxed and waned over the years depending on different NT Government priorities. There is now only a very small team that provides a limited research, extension and industry development role.

A major category of floriculture in the NT is the sale of native plants and seeds for landscaping and rehabilitation. Greening Australia (GA) plays a big part in sourcing, supplying and growing a variety of native plants and grasses, as well as providing outreach on best practice land-care (GA 2014). They have been involved in the harvesting, distribution and re-establishment of native grasses in the semi-arid subtropical region of the NT since 1993. GA supplies seed from a large range of grass species native to northern Australia for use in re-establishment of native pasture, mine site vegetation, roadside vegetation, erosion control/bank stabilisation, dust suppression, weed suppression, conservation and biodiversity enhancement, habitat restoration, landscaping, nurseries and research. GA tries to involve remote Indigenous Ranger groups and others in this business and provides them with equipment and support to collect seed of provenance. GA also contributes to Florabank, which stores seed from a variety of provenances. GA has nurseries in both Darwin and Katherine and supplies a wide range of local native plants to the general public, professional landscapers, local council, other nurseries, Landcare groups, mining companies and others carrying on revegetation or native landscaping works.

Another supplier of seeds is Top End Seeds which has been operating in Darwin since the early 1990s and is now located in Katherine (Top End Seeds 2014). They supply lots of seed for revegetation projects, host a provenance specific seed collection, provide seed cleaning and treatment as well as training in seed harvesting, processing, storage and sowing. There are a number of commercial nurseries throughout the Darwin and Katherine region which retail and / or wholesale a variety of plants and other floriculture products. They produce a range of native and exotics plants for residential properties, retail stores, and landscape gardeners. Additionally there are other businesses which

supply the interior plants market along with several smaller growers who supply product for a number of weekend markets in the major town centres.

Feedback from participants involved in the surveys, workshop and on-site interviews provided a fairly consistent interpretation of the history, current state and future of mainly the cut-flower industry. There were 11 survey responses that were completed during this project; nine were from cut-flower growers, one from a nursery and one from an Association. These findings were supported with face to face interviews at the workshop and at a site visit with two growers. Both growers supplied local and interstate markets and reported transport costs having reduced profit margins of interstate produce considerably and resulting in a shift towards local markets. Other interesting observations provided by the growers interviewed were that the average age of growers was advanced (mostly 50-60 years), with few younger people entering this industry. Also, there was little co-operation between growers to collectively address key constraints, such as high freight costs.

The Aboriginal community visited was found to have had a number of different floriculture or horticulture type projects in the past. These included cycad whole plant harvesting, cycad frond harvesting for local markets and vegetable and fruit crops for local community supply. The continuation of these projects seemed to have been related to the changes in the supporting welfare funded program and the associated coordinators role. It is likely that their purpose may have been training orientated in many cases. Many Aboriginal communities are now looking for wildlife based enterprise to generate income, and there is interest in floriculture projects. There is a clear need for better engagement, mentoring and support to assisting these communities in choosing and developing the most appropriate type of enterprise.

In the first interstate “walking the chain” study, ABT gained valuable knowledge and recorded the operating practices for selecting, collecting, washing, grading and packaging cycad fronds. A total of 650 cycad fronds were collected and 480 were marketable at close to a 75% marketable rate. The trial shipment was sent by air freight costing AUD557 (AUD7.15/kg). This rate was too high to make a profit, although the purpose of the trial was quantifying logistics rather than quantifying profitability. It was evident that an alternative method of delivery, such as road freight, must be considered by potential Indigenous suppliers. This means there will be longer hours of shipment. Postharvest research is needed to ascertain relationships between product quality, vase life and shipping conditions, such as temperature and humidity. From this initial work it is recommended that cycad fronds be packaged with plastic sleeves and shipped under an ambient temperature of 4<sup>0</sup>C. Another important finding through “walking the chain” was the relative mark-up along the way with interstate wholesalers requiring 25-40% margin to have reasonable profits and florists needing around 100% margin.

A positive aspect from this trial is that there is interest from interstate wholesalers in establishing business relationships with potential suppliers of NT cycad fronds. Countering this potential demand is the finding that there are other large supplies of foliage lines, such as *Sticherus* or leather fern and *Caustis blakei* (foxtail/koala fern), available in state capital cities. These products would compete with cycad fronds and are sold for approximately AUD1.00 per stem at the wholesale market. After the Sydney market trial, an alternative interstate value chain was ‘walked’ which sold through a large local flower grower and consolidator of NT floricultural products. The consolidator had established businesses connections with several interstate floricultural wholesalers in Sydney, Adelaide and Melbourne. The consolidator was able to handle larger quantities

of fronds of 500 bunches/week or 2,500 fronds/week and to negotiate very competitive air freight rates. Significantly for Indigenous suppliers of the product, this meant joining an existing efficient value chain which can handle more quantity and had established business linkages through the supply chain. However, it did add one more intermediary between Indigenous suppliers and interstate wholesalers which would erode any potential profits.

Given the margins for the two traced interstate value chains, it is evident that there is not enough profit for any potential Indigenous cycad frond harvester within a small scale enterprise development. Nonetheless, the main purposes of the two trials were to collect baseline data from both demand and supply sides and to initiate some relationship with value chain partners. In a follow-up interview, the interstate wholesaler indicated that a better situation in the future is for them to pay about AUD0.70-0.75/frond to sell at about AUD1.00/frond, rather than AUD1.30/frond in the trial, at the wholesale market (C. Scott, pers. commun., 2012). This proposition presents helpful information for cost/profit analysis and to determine whether it is worthy of pursuing wild harvest of cycad fronds by the Indigenous communities in and around Darwin area.

## **DISCUSSION**

The initial rapid growth which was reported in the first 10 years of cut-flower industry in the NT (Sullivan, 1997) seems to have been followed by a period of consolidation with several growers leaving the industry and a stabilising of production levels. Our meetings with growers, DPIF staff and other stakeholders involved in the floriculture industry identified a number of key factors being responsible for this trend. These include a lack of competitiveness in cultivation of all but a few species of cut-flower due to costs associated with distance from market and scale of operation, limited value chain options, disease affecting some important commercial species, fragmentation of the industry group, poor internal industry engagement, an expensive and unreliable source of trained labour and legislation inhibiting germplasm transfer and collaboration in development of new products. In recent years there has been a number of airfreight surcharges (fuel and security) without market price increases in cut-flowers which anecdotally has forced growers out of the industry or at least to diversify their value chains and markets.

Darwin is the capital of the NT with a very small population of ~120, 000 people. The demand for cut-flowers is limited and restricted to a few local markets, a small number of florists and hotel and supermarket chains. Large interstate markets are 3000 kilometres to the south and east of Darwin and costs associated with air and road freight make it very difficult to be competitive in growing cut-flowers. Traditional suppliers to these large city markets are often much closer and, hence, are more competitive. The category of cut-flowers which the NT (monsoonal tropics) can be competitive in is exotic tropical flowers such as Heliconia, flowering gingers and orchids. This competitiveness is due to climate. That is, these species cannot be produced in cooler temperate regions close to the main Australian markets. Thus demand for NT flowers is driven by restricted supply regions within Australia. Complimenting this has been the selection and development of a diverse range of cultivars within each tropical flower category, principally by NT DPIF and some industry leaders (Hoult and Marcsik, 2000). It was noted that all Zingiberale (the botanical order that contains banana, heliconia and gingers) have restrictions on importation of plant material into Australia so as to protect the large

Australian banana industry from exotic disease incursions. This restriction will limit any future new germplasm development of heliconia and ginger.

Darwin cut-flower supplies to the main Australian markets were dominated by local consolidators who have all left the industry in the past 5 years. These consolidators had established value chains and negotiated better airfreight rates. In departing the industry, their smaller suppliers were left to establish their own local and interstate value chains and some did not continue to operate. The NT Cut Flower Association, which was formed in 1997, ceased to function in 2012/13. This further fragmented the industry and impacted negatively on opportunities for remaining growers to collectively reduce agronomic and freight costs by increased economies of scales.

Extension activities have mainly been through NT DPIF and the former NT Cut Flower Association. The later was also active in some industry based research on sustainable irrigation and nutrition practises for Heliconia and ginger production (Hoffman 2013). The cut-flower industry now sits within the NT Farmers Association which is also providing limited extension and executive support. DPIF currently has an extension officer who provides some time for engagement with industry members in an advisory capacity. This service has not, in any great capacity, extended to Indigenous communities which require a different approach to training. This extension role which had been provided in part by the ABT until they shut down in 2013 and so is now somewhat lacking.

Another major impact on the operations of small scale cut-flower growers is the expense and difficulty in retaining skilled workers. Most of the current cut-flower growers are 50+ in age. They reported a poor recruitment of young people into the industry, as well as a difficulty in getting skilled workers to assist them. This is a common issue for several small NT based industries in the NT, especially as the region is experiencing a large expansion in the mining/resource sector that has placed increased strain on available skilled and semi-skilled labour.

The findings from the research conducted by ABT and DPIF on the value chains of cycad fronds support many of the findings outlined above. The shipping costs of airfreight are prohibitive, especially if there are similar products sold that are sourced close to those markets. There are very limited freight options for flower growers or consolidators in the NT. Air freight is cost prohibitive, has limited capacity and has issues with priority “payloads”. That is, lower priority freight is off-loaded at transit ports if there is a need for higher priority payloads. Consequently product maybe delayed for several days which impacts on quality for highly perishable products like cut-flowers. Road freight, whilst more cost effective than air, takes longer to arrive at destinations and requires refrigeration to ensure product quality is maintained. As most road freight is a mix of perishable product, the largest volume and highest priced commodity determines traveling temperatures. This often is seafood which requires colder transit temperatures than the small loads of cut-flowers and consequently cut-flower quality can be severely affected in transit.

An area which was not considered in any detail in the cycad frond value chain analysis was the level of extension and support role that would be required by Aboriginal communities to be involved. However, the “walking the chain” process was an excellent learning tool for those Aboriginal woman involved. It highlighted the value adding steps and the expenses inherent in the potential cycad frond supply chain. Quality, consistency and volume are required in supplying markets. Being able to meet any of these criteria with wild harvest product is difficult, especially if operating from remote communities

that may be distant from the main despatch town coupled with limited infrastructure, such as cool storage facilities. Given the NT remoteness, low population, high cost of employment and difficulty in retaining qualified staff it will always be difficult to compete with cut-flower growers that operate close to markets and / or have much lower wages and costs of production. For new varieties of exotic tropical flowers that grow in the northern part of the NT it may be economies of scale that need attention. Either larger operations or cooperatives may be able to reduce costs of production and secure better shipping rates. There are other ways to reduce final costs to buyers and these are illustrated by the success of Majestic Orchids and Cycad International in the NT who shorten the value chain by cutting out the consolidator and selling directly to the buyer through the Internet.

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