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THE MARKETING OF FRESH VEGETABLES

(Special Project on Vegetable Production)

by

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PREFACE

Right at the outset of the Special Project on Vegetable Production in the Pacific Islands, emphasis was laid on the marketing of produce on both the domestic and external markets. The officer responsible for the project therefore felt that three stages should be considered in carrying out surveys and providing the facilities required to improve harvesting, as well as the packing, grading and marketing of vegetables:

(a) Survey in individual territories of the present status of harvesting and marketing of fresh vegetables, to be carried out by a marketing expert. This survey was intended to result in recommendations on grading of vegetables, the use of standard packaging and containers, and the technical and business training of those in charge of marketing in the various Departments of Agriculture within the region.

(b) Purchase of standard packaging and containers as recommended by the expert, and supply of these to territories interested in vegetable production. These materials were to be tested during 1975 in order to ascertain whether they suited local conditions and requirements in individual islands. At the same time, a training course was to be held for those in charge of marketing fresh vegetables.

(c) Return of the expert to the Pacific in 1976, with priority given to the territories visited in 1974, in order to assess progress made since his previous visit and action required to increase the efficiency of vegetable marketing; the ultimate goal should of course be the marketing of good quality produce supplied as regularly as possible, on both the domestic and external markets.

While these surveys were in progress, a cold store was built at Sigatoka, Fiji, in 1974 in co-operation with the Department of Agriculture, also as part of the Special Project on Vegetable Production in the Pacific. It is composed of four separate units of 3.65 x 3.15 x 3.15 metres, which makes it possible to store different vegetables in each unit at different temperatures. Each unit has its own regulator for temperature and humidity.

The operation of the cold store will provide useful information on vegetable storage as well as on the operating costs during 1975.

In 1974 the South Pacific Commission called on Dr Jack Ishida, Produce Marketing Expert, College of Tropical Agriculture, Hawaii University, Manoa, Honolulu, Hawaii, to carry out the fresh vegetable marketing survey and provide advice on ways and means of improving marketing conditions. His report is submitted herewith for consideration.

Unfortunately, it will not be possible to implement most of Dr Ishida's recommendations in 1975, since for budgetary reasons the Commission Secretariat has had to "freeze" part of the amount allocated for the purchase of packaging and containers which were to be tested in individual territories. The same applies to the funds required for training staff in charge of marketing in various Departments of Agriculture.

However, the project officer maintains close contact with Dr Ishida. Both will make every effort to ensure that, within the resources at their disposal, the marketing of fresh vegetables, on which their production is dependent in most cases, continues to receive the attention it deserves.

Michel Lambert
Tropical Agriculturalist
South Pacific Commission

GENERAL INTRODUCTION

At the request of the South Pacific Commission, the short term marketing expert agreed to evaluate the marketing of fresh vegetables as currently practised in the South Pacific Islands during the period July 15 to August 24, 1974.

The Expert's services were sought in an effort to upgrade the present marketing system, specifically in the areas of harvesting, grading, packing and marketing of fresh vegetables. The observations were conducted according to a timetable prepared by the South Pacific Commission, i.e. Fiji (July 15-20; August 15-18), New Hebrides (July 21-27), British Solomon Islands (July 28-August 4), Papua New Guinea (August 5-9), New Caledonia (August 11-14). A proposed visit to Tonga unfortunately had to be cancelled because of uncertain flight schedules.

In his evaluation, the expert took into consideration political and social conditions, the present level of economic development, and receptiveness to change in the countries visited.

Experiments in other crops (vegetable varietal trials) initiated by the South Pacific Commission's Tropical Agriculturist were encouraged with a view to stimulating economic diversification.

To supplement the expert's investigations and recommendations, it is suggested that staff members from each of the islands responsible for vegetable production and marketing attend a special fresh vegetable marketing workshop which the expert plans to conduct in July, 1975 in Hawaii.

The expert wishes to acknowledge the co-operation received from the officials of the South Pacific Islands visited, and to thank the South Pacific Commission for sponsoring his visit.

FIJI

Introduction

The major root crops produced in Fiji are taro and cassava. Sweet potatoes and yams are also produced but are considered to be secondary crops. There is a strong demand for high quality temperate-type vegetables, especially from the tourism sector, which, during certain months of the year, cannot be met from local production. Although over 800 tons of tomatoes are imported annually from New Zealand, the seasonal production of tomatoes and cucumbers has created periods of shortages and surpluses. Moderate quantities of head cabbage, Chinese cabbage, string beans, eggplants and sweet peppers are produced, and about 350 tons of carrots and 4,500 tons of onions are imported each year. Semi-head lettuce can be produced in cooler areas but Fiji imports about 300 tons of head lettuce. Bananas and pawpaw are produced in sufficient quantity to meet local demand.

Fijian farmers lack the knowledge and incentives necessary to increase their production of vegetables. Indian and Chinese farmers are more successful, and recently foreign firms have begun to invest in the vegetable industry. Fiji must increase vegetable production in order to meet local demand and to replace imports of crops which can be produced in the islands, such as lettuce, tomatoes, carrots, onions and potatoes.

Wholesale markets are non-existent in Fiji. The bulk of the vegetables are sold directly to consumers in Suva, Lautoka, Nadi's Central Market and at local roadside markets which are scattered all over the islands. Markets are generally disorganized and insanitary with no uniform grading, packaging or pricing practices enforced.

A National Marketing Authority was established by the Parliament of Fiji "to facilitate and develop internal and export markets for products of Fiji".^{1/} The NMA has been entrusted with very broad powers to bring about an orderly marketing of Fiji's agricultural products. Its volume of business has been increasing steadily, and is expected to reach the \$1,000,000 mark by 1975. The objective of the NMA is to stabilize the market and give a fair return to farmers; it is not a money-making enterprise. The NMA exports taro, cassava and off-season vegetables to New Zealand. It also has retail outlets in Suva and Lautoka. Surplus commodities bought by NAM are usually sold at lower than the market price.

Observations and Recommendations

1. Production must be increased in Fiji to lessen dependence on imports.

Although the farm land is suitable for cultivation of fresh vegetables, the Fijian people prefer to farm only on a subsistence scale. On the other hand, some Indian, Chinese and foreign-financed farmers are doing very well.

Recommendations: The seed varietal programme initiated by the South Pacific Commission should be continued in order to explore new crops of economic importance. Extension-type educational programmes on production techniques, similar to one recently conducted in the Nausori district, should be initiated in all the major producing areas. The Fiji College of Agriculture should take a more active and progressive role in this area. Work on vegetable production at Sigatoka and in Nadi should be encouraged and extended to other areas. Production of quality vegetables is the major problem in Fiji.

2. Central and local markets should be improved.

The central markets in Suva, Nadi, and Lautoka are disorganized and insanitary. Lack of standardization and of proper labelling have contributed to chaotic pricing and marketing practices. Social values seem to dominate over economic and health values, as the residents of Fiji continue to patronize the dilapidated and insanitary markets. Immediate change is impossible but the Fijian government should conduct an educational programme on health and sanitation with emphasis on proper food handling at the markets.

Recommendations: Regulations governing grades and standards for the four major crops (taro, cassava, tomatoes, cucumbers) should immediately be formulated. The establishment of grades and the use of standard containers with uniform weights will facilitate the movement of produce through the marketing channel. The short term marketing expert would be glad to furnish detailed information on grades and standard containers if requested.

^{1/} Act No. 3 of 1971

3. The National Marketing Authority

The NMA is meeting the objective of stabilizing prices and returning a fair share to the farmers, but should go a step further and try to retain a surplus (profit) for the organization. It should be the major force seeking the establishment of grades and standard containers in the marketing of root crops such as taro and cassava.

Recommendations: Fiji is a labour-intensive country and labour is quite cheap. However, work simplification methods should be adopted in order to upgrade labour efficiency. The NMA should continue to coordinate production and marketing practices by encouraging the establishment of co-operative groups in the production areas with the aim of solving transportation and communication problems. It should take the initiative in discussions on the possibility of establishing a processing plant for root crop products (for example taro chips, baby food, and tapioca) for export purposes. The NMA should also consider importing vegetables directly in order to bring about a more orderly marketing of vegetables in Fiji.

4. Extension's role in marketing

The Extension Service of the Department of Agriculture is responsible for educating growers and handlers in the proper methods of grading and packing produce for market. No programme on these lines was in evidence during the expert's visit to Fiji. The Market News Programme through the news media is appreciated, but there is a need to assess how much of this information is being used by the growers and handlers. Unless the information is used as a guide in the production and marketing of produce, the objective of this programme will not be met.

Recommendations: Agent training in marketing, and specifically in (1) the use of marketing information, (2) the organization and operation of agricultural co-operatives, (3) the establishment of grades and standard containers, (4) proper harvesting and packing methods, and (5) the coordination of the production and marketing segment should be incorporated in the long range programme of the Extension Service.

5. Need for research in marketing

Basic research in marketing is lacking in Fiji. The Vegetable Commodity Paper, published in April, 1973 by the Sigatoka Research Station, is an excellent publication giving guidelines on costs and returns for lettuce, tomatoes, carrots and onions, and on the market demand for these crops. It also recommends grades and standards for tomatoes and carrots and provides other pertinent information which should be used as a reference.

Recommendations: Research on the ingredients of marketing cost is needed. What are the costs of labour, transportation, storage, financing, in marketing? What are the wholesale and retail markups? What is the loss from spoilage and shrinkage? These questions must be answered before any corrective measures can be taken. The Department of Agriculture through the NMA and the research stations can conduct these studies.

Conclusion

In the area of marketing the Department of Agriculture in Fiji is the most advanced of the countries which the short term expert visited, but improvements can be made. There is great potential for increasing the

production of fresh vegetables to achieve greater self sufficiency, but production technology and know-how must be improved. The central and local markets should be improved. The National Marketing Authority has a tremendous challenge ahead and can serve as a driving force in improving marketing practices in Fiji. The establishment of grades and standards and rewards for the better farmers in the form of higher prices for good quality Fijian vegetables will serve as incentives. The Extension Service has a tremendous responsibility and in accomplishing its objectives must upgrade the level of staff proficiency through in-service training. Basic marketing research is lacking and the Department of Agriculture should initiate marketing studies.

NEW HEBRIDES

Introduction

Agriculture in the New Hebrides is still in the subsistence stage. Copra is sold in the world market. There are some exports of taro and yams to New Caledonia but the bulk of these two crops is either consumed at home or sold in the local markets. Fresh vegetable production does not meet local demand even during the favourable growing season from May to October. Except for watercress and Chinese cabbage (pak choi) the New Hebrides must depend on imports from Australia and New Zealand for fresh vegetables such as potatoes, onions, tomatoes, lettuce. Fresh vegetables are primarily consumed by the European population and tourists, but the consumption of fresh vegetables by Melanesians is increasing.

Vila, with a population of over 15,000 and Santo with a population of over 4,000 are the two major markets for fresh vegetables. Vila is more affluent than Santo, but Santo has greater growth potential. There is no central wholesale market in the New Hebrides. Prices in general are not sensitive to supply and demand. Farmers prefer to dump their produce rather than sell at a lower price. Open-air markets are held at Vila, Santo and in other areas throughout the islands. There are no cooler or storage facilities in these markets. European-owned stores sell fresh vegetables of both local and foreign origin. There is no grading of produce. Standard containers have not been designated for the major crops.

There are two agricultural co-operatives in Vila, one operated by the French Government and the other by the British Government.

The French Government Co-operative (with which the short term expert spent more time) is both a purchasing and marketing co-operative of the federated type. It has five local Co-operatives in Tanna which send perishables by air and root crops by sea to the Vila market. Refunds are made to members who purchase from the Co-operative, which buys produce from members on a consignment basis. There is no marketing agreement between the members and the Co-operative because of the erratic nature of production. The French Government Co-operative primarily serves schools, hospitals, and hotels and generally sells below market price "to prevent inflation". (The British Government Co-operative apparently sells at market price.)

Transport and dock facilities are inadequate in the Islands and air and boat transport is irregular and infrequent. There was no evidence of the two Government Co-operatives coordinating or pooling their shipments from Tanna which is the major vegetable producing area in the group.

The British Co-operative has a ship arriving from Tanna once in five or six weeks.

The Tagabe Agricultural School in Vila is carrying out varietal trials on cucumbers, tomatoes and other vegetables with a fair degree of success. It also conducts consumer education programmes on health, nutrition and diet. The short term expert was impressed with the work carried out in Tanna where the research farm has obtained excellent results and the local people have become convinced that it is feasible and profitable to produce fresh vegetables using recommended practices.

Observations and Recommendations

1. Need to improve transport and communications.

Transport and dock facilities are inadequate and lacking in the outlying islands such as Tanna. It has not been feasible to construct permanent docks and buildings because of hurricanes.

Recommendations: Some kind of make-shift hurricane-proof dock should be constructed to reduce transport cost. At this stage, air transportation of vegetables from Tanna seems most feasible but poor communication between the Co-operatives and the airlines has been the primary reason for the lack of air space, according to the airline representative. This problem should be resolved immediately. Communication between the French and British Government Co-operatives should be improved with the aim of coordinating and pooling shipments of produce by the two Co-operatives so that weekly boat shipments and plane-loads of produce can be sent to Vila and Santo. The Department of Agriculture should take the initiative in this project.

2. Agricultural Co-operatives in the New Hebrides.

Under existing conditions, the two Co-operatives are doing a commendable job but there is room for improvement. As cited above, better coordination and co-operation between these two organizations will contribute to a more orderly marketing of fresh vegetables in the islands.

Recommendations: The concept of agricultural co-operatives seems to be understood by management, but the grower-members seem to lack understanding of their role. Education on co-operative principles and concepts should be conducted for both members and management. This should be a long term project with the Department of Agriculture Extension Division taking the initiative. Marketing agreements between growers and the Co-operative should be made to maintain the loyalty of members. Also, a guaranteed price to the farmers will serve as an incentive to increasing the production of quality vegetables.

3. Grades and standards.

There is no grading or standardization of produce or containers in the islands. There is no price-quality relationship, and this has contributed to chaotic pricing and marketing practices.

Recommendations: The setting of grades and standards for taro, yams, tomatoes, cucumbers, onions, and potatoes would facilitate the movement of these products through the marketing channel and would serve as a basis for rewarding the better farmers. Grades and standards similar to those of Australia could be followed, and the short term expert will be glad to furnish them. Standard containers with uniform weights should be adopted

for the major crops. Locally produced coconut baskets could serve as standard containers for yams and citrus. Fibreboard cartons for tomatoes, at 25-30 pounds per carton; for cucumbers, 25-30 pounds; for peppers, 20-25 pounds are recommended. For onions and potatoes, the expert would recommend mesh bags holding 5-70 pounds rather than the currently used copra bags. These cartons and bags could be obtained from Australia or New Zealand and purchases should be pooled by the two Co-operatives to get volume discount.

4. Extension's role in marketing

The Extension Service of the Department of Agriculture is responsible for educating the growers and handlers in the proper method of grading and packing of produce for market. The short extension courses already conducted should be intensified. The Market News Programme through the news media is appreciated: but it is necessary to evaluate how much of it is being used and understood by the growers and handlers. Unless the information is used as a guide in the production and marketing of produce, the objective of this programme is not met.

Recommendations: Agent training in marketing, specifically: (1) the use of marketing information, (2) the organization and operation of co-operatives, (3) the establishment of grades and standard containers, (4) the proper harvesting and packing methods, and (5) the coordination of the production and marketing segment should be incorporated in the long range programme of the Extension Service.

5. Food Distribution Centre

Open-air retail markets exist in Vila, Santo and the outlying districts which make it difficult to regulate and control grades and standards or to enforce health and sanitary regulations.

Recommendations: The Department of Agriculture should take the initiative and construct a permanent building to serve as a food distribution centre for wholesalers and retailers. This project will make the work of market news reporting easier and more effective and will provide an opportunity for supply and demand to regulate the flow of produce in the islands. This centre should have refrigeration and storage facilities and ample room for parking and for future expansion.

6. Increase fresh vegetable production in the New Hebrides

The New Hebrides depend upon imports for the bulk of their fresh vegetables. There is a need to increase production of local vegetables to replace imports. The shift in taste among the Melanesians towards fresh vegetables and the expected increase in tourism will create a greater demand for fresh vegetables.

Recommendations: Varietal tests for the major crops, which were started by the South Pacific Commission, should be continued in order to discover the varieties of vegetables most suited for the islands.

7. Need for research in marketing

Basic and applied research in marketing are lacking in the New Hebrides.

Recommendations: Research on the ingredients of marketing cost is needed. What are the costs of labour, transportation, storage, financing, in marketing? What are the wholesale and retail markups? What is the loss

from spoilage and shrinkage? These questions must be answered before any corrective measures can be taken. The Department of Agriculture could conduct these studies.

Conclusion

There is great potential for increasing the production of fresh vegetables in the New Hebrides Islands but production technology and know-how must be improved. A commendable job is being done by the research station on Tanna. Extension officers of high calibre should be recruited and assigned throughout the major vegetable producing areas. A food distribution centre would facilitate and make more effective the work of market news reporting and the regulation both of grades and standards and of health and sanitation would become easier. Grades and standards for the major crops should be established and would serve as an incentive by rewarding the better farmers in the form of higher prices for quality island vegetables. Transport facilities must be improved. Communication between Co-operatives and among growers must be improved to make possible more frequent shipments by both sea and air. The Extension Service has a tremendous responsibility and in accomplishing its long range objective must upgrade the level of staff proficiency through in-service training. Basic marketing research is lacking and the Department of Agriculture should initiate such studies.

BRITISH SOLOMON ISLANDS ^{1/}

Introduction

The main Solomon Islands are mountainous, heavily wooded, well-watered and largely undeveloped. Subsistence agriculture continues and the standard of living in the islands is very low. The islands are thinly populated with about 180,000 people. Honiara is the largest city with a population of 20,000.

A variety of vegetables can be grown in the islands. They include tomatoes, cucumbers, watermelons, sweet peppers, white radish, green onions, Chinese cabbage, yam and taro. Head cabbage, head lettuce, celery, carrots, potatoes and onions are imported, mainly from Australia.

The market for fresh vegetables is small as the population of expatriates has not increased during the past few years. Then too, according to one British officer, the expatriates have become accustomed to the local diet which is an opposite phenomenon to that found in Fiji and the New Hebrides. Also, the number of tourists visiting the islands is small. However, pressure from the outside will force the islands to produce more fresh vegetables as social changes and economic development take place in the Solomon Islands.

The short term expert spent most of his time in the vicinity of Honiara and did not have an opportunity to see the total agriculture in the islands. The following observations and recommendations are made under this condition.

Observations and Recommendations

Since the production of fresh vegetables is in its infancy in the Solomon Islands, it may be premature to make recommendations to improve

^{1/} Since only very limited funds are available in the British Solomon Islands for work on vegetable production, studies undertaken in this field have also been limited.

the marketing of fresh vegetables. However, the Administration could consider the following recommendations in its long range marketing programme. At present, production is the major problem in the islands.

1. Production of fresh vegetables must be increased in the Solomon Islands

The vegetable seed varietal tests at the research station, which were initiated by the South Pacific Commission, were not very successful. The Administration may not have clearly understood the purpose of the programme. The short term expert was impressed by the variety of vegetables produced at the Betikama Seventh Day Adventist High School. Quality vegetables can be produced in the Solomon Islands if recommended practices are followed.

Recommendations: Fresh vegetables can be grown on the islands, but the local people are sub-marginal farmers who prefer to farm on a subsistence scale. Well-trained horticulturists should be assigned throughout the islands to help the local people with their production programme. The seed varietal selection programme should be continued in order to explore crops of economic importance.

2. Central market in Honiara should be improved

The central market in Honiara is disorganized and insanitary. Lack of standardization of grades and containers has contributed to chaotic pricing and marketing practices. Social values seem to dominate over economic and health values, as the residents of Honiara continue to patronize the dilapidated and insanitary markets. Immediate change is impossible but the Administration should conduct an educational programme on health and sanitation with emphasis on proper handling of food at the markets.

Recommendations: Grades and standards for locally grown tomatoes, Chinese cabbage, cucumbers and taro should be adopted. The establishment of grades and standard containers will facilitate the movement of produce through the marketing channel.

3. Need for research in marketing

As previously mentioned, production of fresh vegetables is in its infancy in the Solomon Islands, and it may be premature to initiate any research on marketing. However, the Administration should consider research in marketing in its long range programme.

Recommendations: Information on the ingredients of marketing cost is needed. What are the costs of labour, transportation, storage, financing in marketing? What are the wholesale and retail markups? What is the loss from spoilage and shrinkage? These questions must be answered before any corrective measures can be taken. The Department of Agriculture can conduct these studies without much difficulty.

4. Department of Agriculture's role in marketing

The Extension Service of the Department of Agriculture is responsible for educating growers and handlers in the proper method of grading and packing of produce for market. A programme of this kind was not in evidence in the Solomon Islands.

Recommendations: Officers and agents should be trained in marketing, specifically: (1) the establishment of grades and standard containers, (2) proper harvesting and packing methods, (3) the establishment of a market news programme and (4) the coordination of the production and marketing segment should be incorporated in the long range programme of the Extension Service.

Conclusion

Fresh vegetable production in the British Solomon Islands is still in its infancy. There is great potential for increasing the production of fresh vegetables beyond the current level and becoming less dependent on imports. However, in order to do this, production technology and know-how must be improved. The central market in Honiara should be improved. The establishment of grades and standards to reward the better farmers in the form of high prices for quality vegetables will serve as an incentive for the local people to increase vegetable production. The Extension Service faces a tremendous challenge and in accomplishing its objective must upgrade the level of staff proficiency by hiring better personnel and by in-service training. Basic marketing research is lacking and the Department of Agriculture should initiate marketing studies.

PAPUA NEW GUINEA

Introduction

Papua New Guinea is mountainous, heavily-wooded, well-watered, and largely undeveloped. Subsistence agriculture continues and the standard of living is very low. The island is thinly populated with about 640,000 local people and about 14,000 Europeans (1970 estimates). The island is rich in minerals, has fertile soil and ample water, and has the potential of becoming one of the leading agricultural nations in the future. However, because of the lack of capital and technology, agriculture has not been developed on a commercial scale. Land tenure problems continue to plague the development of agriculture. The major crops are copra, rubber and cocoa. Vegetable production is still in its infancy.

Papua New Guinea depends on imports from Australia for its potatoes (3.5 million kg.), onions (1.5 million kg.), lettuce (200,000 kg.), head cabbage (250,000 kg.), tomatoes (350,000 kg.), carrots (150,000 kg.), celery (130,000 kg.), and cucumbers (40,000 kg.) per year.

A variety of vegetables can be grown in the Highlands. These include potatoes, sweet-potatoes, tomatoes, lettuce, head cabbage, carrots and cucumbers. The market for fresh vegetables is small as the number of expatriates has not increased during the past few years. However, with the expected increase in tourism and the change in taste of the local people, the demand for fresh vegetables should increase in the future.

The short term expert had the opportunity of visiting the major markets in Port Moresby and Lae and the major vegetable producing areas in Mendi, Wabag, Mt. Hagen, and Goroka. Poor roads and inadequate transport services and facilities are the major factors which have contributed to the poor condition of fresh vegetables upon arrival in the markets. Refrigeration facilities are also inadequate.

The Papua New Guinea Government controls the sales of local vegetables to government institutions, super-markets, and retailers. The Papua New Guinea Government also imports vegetables when local supply is inadequate to meet contracts.

Observations and Recommendations

Since the production of fresh vegetables is still in its infancy in Papua New Guinea, it may be premature to make recommendations to improve the marketing of fresh vegetables. However, the Administration should consider the following recommendations in its long range marketing programme. At present production is the major problem in the island.

1. Production of fresh vegetables must be increased in Papua New Guinea.

Fresh vegetable production must be increased to reduce imports of vegetables from foreign countries. The vegetable seed varietal tests, which were initiated by the South Pacific Commission, have been successful in the Highlands and in the Port Moresby area. The short term expert was impressed by the variety and quality of vegetables produced in the research station in the Laloki District and at one of the schools in the Highlands.

Recommendations: The Department of Agriculture should continue its seed varietal tests in order to explore crops of economic importance. Certified seeds, especially for potatoes, tomatoes, lettuce and cucumber must be obtained. Well-trained horticulturists should be assigned throughout the major producing areas to help the local people with the fresh vegetable production programme. Extension type educational programmes on production techniques should be initiated. Land tenure problems need to be solved so as to create a more favourable investment climate for vegetable production.

2. Markets in Port Moresby, Mendi, Mt Hagen, Lae, Goroka and other major towns should be improved.

The central markets in Port Moresby, Mendi, Mt Hagen, Lae, and Goroka are disorganized and insanitary. Lack of standardization of grades and containers has contributed to chaotic pricing and marketing practices. Social values dominate over economic and health values as the residents in these areas continue to patronize the dilapidated and insanitary markets. Immediate change is impossible, but the Administration should conduct an educational programme on health and sanitation with emphasis on proper handling of food in the markets.

Recommendations: Grades and standard containers for locally grown potatoes, sweet potatoes, tomatoes, lettuce and cucumber should be adopted. Grades and standard containers similar to those in Australia could be used. The establishment of grades and standard containers will facilitate the movement of produce through the marketing channel and will also serve as an incentive for farmers to grow quality vegetables.

3. Co-operative organizations in the producing areas should be strengthened.

The Co-operative in Wabag is doing very well in spite of the adverse conditions under which it is operating. The formation of co-operatives in villages will make it possible to reduce transportation, storage and other marketing costs by the pooling of resources.

Recommendations: The Department of Agriculture in Papua New Guinea through its Extension programme should initiate and intensify co-operative education in the area of organizational structure, financing, and role of members and directors.

4. The Papua New Guinea Fresh Food Project

The Papua New Guinea Fresh Food Project which was started this year in Port Moresby and Lae is evidence of attempts by the Department of Agriculture to improve the marketing of fresh produce in Papua New Guinea. The Fresh Food Field Officers are doing a commendable job in spite of the poor transportation service and inadequate storage facilities. There are signs of coordination of production and marketing of fresh produce through the Fresh Food Project.

Recommendations: The management in the Port Moresby and Lae Fresh Food Markets should initiate job simplification programmes to cut the cost of labour, reduce spoilage and damage, and to speed the movement of produce through the marketing channel. Labour is cheap in Papua New Guinea but the efficient use of labour will be very important in the near future. The Government of Papua New Guinea through its Public Works Programme should improve roads and airports for faster and safer movement of produce to market.

5. Extension's role in marketing

The Extension Service of the Department of Agriculture is responsible for educating growers and handlers in the proper method of grading and packing of produce for market. Such a programme is conducted on a limited scale in Papua New Guinea.

Recommendations: Agent training in marketing, specifically (1) the use of marketing information, (2) the organization and operation of agricultural co-operatives, (3) the establishment of grades and standard containers, (4) the proper harvesting and packing methods, and (5) the coordination of the production and marketing segments should be incorporated in the long range programme of the Extension Service.

6. Need for Research in Marketing

Basic research in the marketing of fresh vegetables is lacking in Papua New Guinea as production of vegetables is still in its infancy. The Administration should consider including research in marketing in its long range programme in order to solve its marketing problems.

Recommendations: Information on the ingredients of marketing cost is needed. What are the costs of labour, transportation, storage, and financing in marketing? What are the wholesale and retail markups? What is the loss from shrinkage and spoilage? These questions must be answered before any corrective measures can be taken. The Department of Agriculture can conduct these studies without much difficulty.

Conclusion:

Vegetable production in Papua New Guinea is still in its infancy. Fertile soil, ample water supply and a wide range of elevation and climate offer great potential for Papua New Guinea to increase fresh vegetable production. However, in order to do this, land tenure problems must be solved, better production technology must be adopted and a large amount of capital must be invested. The central markets in the major cities and in the small towns must be improved. The establishment of grades to reward the better farmers in the form of higher prices for quality vegetables will serve as an incentive for the local people to undertake and to increase vegetable production. The Extension Service faces a tremendous challenge

and in accomplishing its objective must upgrade the level of staff proficiency by hiring better personnel and through in-service training. Basic marketing research is lacking and the Department of Agriculture should initiate marketing studies.

NEW CALEDONIA

Introduction

New Caledonia, with an estimated population of 120,000, is the wealthiest country in the South Pacific region, and has one of the highest standards of living in the world. The export of nickel in some form accounts for over 95 per cent of the value of total exports and its dependence on the price of nickel in the world market puts New Caledonia in a vulnerable economic position. Nickel is exported to Japan, France and the United States.

Tourism is the second largest source of income in New Caledonia. Large numbers of tourists from Australia and New Zealand arrive regularly but in the very near future an influx of tourists from Japan is expected to boost the economy of the country.

New Caledonia imports most of its food supply (e.g. animal products, beverages) and much of its fresh vegetable requirements. The land area of 6,225 square miles is highly mineralized and mountainous, with only about 1/10 of the area classifiable as arable land.

Potatoes are imported in sizeable amounts but in recent years crop production has been expanded. Fresh vegetables can be grown to meet local demand for about half of the year. On the west coast of New Caledonia production of vegetables is possible year round if adequate irrigation facilities are installed. During the period December to April, weather conditions are unfavourable for fresh vegetable production in some areas.

The varieties of vegetables that can be grown in New Caledonia include potatoes, onions, tomatoes, cucumbers, sweet peppers, eggplants, head cabbage, Chinese cabbage and lettuce.

Observations and Recommendations

Although New Caledonia has the most advanced vegetable production technology in the South Pacific region, production is insufficient to meet local demand. Since crop production is the major problem in the island, no marketing problem exists at present.

1. Fresh vegetable production must be increased in New Caledonia.

New Caledonia, like other South Pacific countries, must try to increase its vegetable production in order to reduce imports from foreign countries and be self-sufficient. The short term expert was impressed with the efforts and accomplishments of the horticulturist at the Agronomic Research Station at Bourail-Nessadiou.

Recommendations: New Caledonia should continue to serve in a leadership role in setting the pace for improving and increasing the production of fresh vegetables in the South Pacific region. The varietal seed tests should be intensified and recommended varieties made available to other South Pacific countries. Coordination of efforts within the region will bring about better results. New Caledonia should consider the installation of irrigation facilities for the western sector of the territory in order to increase its vegetable production.

2. Noumea fresh vegetable market

The volume of fresh vegetables sold in the Noumea fresh vegetable market is small. Although the short term expert was unable to observe the actual buying and selling activities, the market place, though small seems well organized.

Recommendations: The Noumea fresh vegetable market facilities are adequate to handle the present volume but the Administration should consider a new site with a view to expansion and an anticipated increase in trading. Standard grades and uniform containers should be developed to facilitate the movement of produce through the central market. The market was sanitary and well organized but administration should conduct educational programmes on health and sanitation with emphasis on proper handling of food in the market.

3. Research in Marketing

Basic research in the marketing of fresh vegetables is also lacking in New Caledonia. New Caledonia and the South Pacific Commission in Noumea should take the initiative in conducting marketing research, similar to their production research now in progress. The Administration should consider research in marketing in its long range programme in order to solve future marketing problems should they arise.

Recommendations: Information on the ingredients of marketing cost is needed. What are the costs of labour, transportation, storage, and financing in marketing? What are the wholesale and retail markups? What is the loss from shrinkage and spoilage? These questions must be answered before any corrective measures can be taken.

Conclusion

New Caledonia is the most advanced territory in vegetable production and should continue to take leadership in this area. Furthermore, she should take the leadership in marketing research. Farmers should be encouraged to increase their vegetable production. Inadequate crop production continues to be the major problem. Immediate change is impossible and not recommended but New Caledonia should consider the establishment of grades and standards for its vegetable crops and should promote an incentive programme for the farmers to increase production.

The work at the research station in Bourail-Nessadiou is outstanding and the short term expert recommends that an annual field day be held at the station to demonstrate the opportunities and the potential of fresh vegetable production in New Caledonia.

The short term expert hopes that the marketing workshop, to be held in Hawaii, will become a reality and that representatives from New Caledonia and other South Pacific Islands will be able to participate.

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