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# RISK MANAGEMENT AND FINANCE ALONG THE CASSAVA VALUE CHAIN IN GUYANA

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## Disclaimer

The opinions and judgments expressed in this working paper only reflect those of the author, and they do not reflect those of IICA, the FAO or its Member Governments. Responsibility for any errors only rests with the author.

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## 1. Executive Summary

Assessing the risk management and finance along the vale chain in the cassava sector has been the primary focus of this study. The study follows a structured approach through separate analysis of the main categories in the value chain; farmers, traders and millers. The principal findings of the study centre on two main points; use of contracts by operators in the value chain is restricted to at best to loose, non-binding arrangements and due to the under-developed state of the cassava value chain, options are relatively narrow in coping with the more serious risks operators are faced by.

The study indicates that farmers are faced mainly by market and production risks. The presence of such risks, result in farmers temporarily changing the market in which they sell their cassava, and diversifying into other crops. As it regards production risks faced, pest attacks are the most prominent. Traders like the farmers, are prone to market risks (particularly sudden changes in input price). Poor storage and generally post harvest handling constitute a significant source of risk for traders as any changes in market demand results in either a build up in stocks requiring additional storage and increased risk for spoilage, while reduced demand in the market equally results in longer storage time and by extension increased risk of spoilage. As it regards the impact on operations of the traders as a result of the risks exposed to, strong evidence exists that traders typically are forced to temporarily seek different markets for both sales and supply. The presence of the identified risks also results in temporary changes from trading in cassava to other ground provisions, and generally on the quantity of cassava traded relative to other provisions traded in. Regarding the case of millers, this category in the value chain is affected by sudden changes in input prices, changes in final consumer demand and changes in the operation of the domestic output market particularly. In light of these risks, millers are typically forced on a temporary basis to seek other markets for their products, temporarily source inputs from other suppliers and temporarily change production mix.

The non use of binding contracts by operators in the value chain coupled with the poorly developed state of the cassava value chain, coping mechanisms are relatively narrow in confronting the more serious risks operators are faced by. In the light of these findings, a number of strategies specifically addressing the identified risks have been recommended.

## 2. Introduction

Cassava is generally regarded as the most important root tuber crop in Guyana, and the staple food commodity for a significant segment of Guyana's population. Cassava is commonly referred to as either "Sweet" or "Bitter" types as a distinguishing classification of cyanide concentration to be found in the cassava. In the coastland areas, the sweet type of cassava is used extensively for several food preparations but particularly boiled (and fried in some instances) and served as a meal. Further, a small number of edible cassava based products from the sweet type of cassava such as pones, chips and cassava/eggballs is produced for local markets. These products are more associated with the coastal areas as against the interior regions.

Bitter cassava is the main type cultivated, processed and consumed in the interior regions. Given however that a higher concentration of cyanide is to be found is this type, the bitter cassava undergoes special processing in order to make it fit for human consumption. Generally, processing is done using traditional methods of the Amerindians whom reside in the interior regions. Among the products produced from the bitter cassava, are tapioca cassava bread, farine, casareep, and beverages such as Paiwari.

While cassava is cultivated in all of the ten administrative regions in Guyana, the highest production is observed in Regions 1, 8 and 9, which are inhabited predominantly by Amerindians.

Cassava is produced mainly on small-size farms, from 0.1 to 2.0 hectares. Approximately 2000 hectares are cultivated each year; production is mainly manual; or partially mechanized. The average yield was 11.02t/ha in 2004. Most cassava is consumed locally; exports are negligible and mainly in the form of cassareep. An important limiting factor affecting the marketing and consumption of cassava in its fresh state is its poor shelf life and high rate of deterioration and spoilage occurring during storage. Practices have been developed to assist in improving the post harvest quality characteristics of this perishable commodity. Given the low use of chemicals, Guyanese cassava production could qualify for an "organic" label, which however requires a certification in order to be translated into an asset in marketing.

While potentially the crop is recognized as being widely versatile in its uses, the sector has remained relatively sluggish in terms of productivity, and development in its value chain. Added to this state of affairs, the sector faces substantial risk in terms of production and marketing. Without the access to adequate and appropriate credit facilities, operators are left with the traditional risk coping mechanisms which are widely regarded as inadequate in mitigating the risks and constraints they are typically faced by.

Based on the problem presented, this study was undertaken with the broad objective of profiling the risk management processes and the potential role of finance in the cassava value chain in Guyana. A survey was conducted in Guyana with the objectives of highlighting the existing and potential risks involved in the operation of the cassava value chain in Guyana; assessing the major risk management mechanisms currently operating in cassava value chain; and suggesting ways for the enhancement of the existing risk management mechanisms in view of the likely developments in the industry.

In light of the nature of the objectives to be addressed, the study relies heavily on qualitative information at both the primary and secondary levels. This analysis in general serves the ultimate goal of aiding the process of the identification of appropriate strategies aimed at supporting the development of the cassava value chain in Guyana as it regards the risk element faced by operators.

An understanding of the types of risks and intensity of identified risks faced by cassava operators in the value chain is prerequisite in the designing of suitable interventions for the sector. The paper utilises concepts drawn from the Agro-food Systems and Chains methodology developed by the Food and Agricultural Organisation[1]. Generally, the methodology will be used in giving guidance in the overall analysis of the risk profile cassava value chain in Guyana.

[1] The Agro-food Systems and Chains is Module 1 of the Course on Agribusiness management for Producers' Associations produced by the FAO Agricultural Management, Marketing and Finance Service Rural Infrastructure and Agro-Industries Division.

## 3. Sample Design and Data Collection

The information used in this study was collected at micro and village levels. The emphasis however was at the micro (family-household-business) level. Specifically, primary data was collected during the period June to September 2009 from a sample of farm households, processors and traders across Administrative Regions 2, 3, 4, 6, 9 and 10. A structured micro-level questionnaire was administered to the typical operators in Guyana's cassava value chain.

A cluster sample design was utilized. Clusters were selected based on naturally occurring districts throughout the administrative regions targeted in this study. From these clusters, interviewees were randomly selected. This approach was used since no reliable sample frame of cassava farmers could be accessed. Eighteen operators were surveyed from the following areas:

- Region 4: Three operators selected from Caledonia/Good Success;
- Region 10: Four operators selected from Linden;
- Region 3: Three operators selected from Salem, Parika Backdam/Ruby, and Hubu;
- Region 2: One operator from Tapakuma;
- Region 9: Six operators from Annai, Moco-Moco, Surama, and Kumu;
- Region 6: One operator from Orealla and Siparuta;

Given the qualitative nature of the questionnaire administered in this survey[2], a small amount of the typical operators in the existent cassava value were selected for interviews. As such, the classification of the operators was inherent in this selective process. The analysis as a result, commences at the level of each classified group identified. The main criterion for their differentiation has been the principal activity in the cassava chain engaged in. Implied in this approach is the assumption that each classified group has broadly similar resource bases, enterprise patterns, and constraints amongst the households or entities captured in the specific grouping, and therefore similar development strategies and interventions would be appropriate. This process yielded three distinct classes; farmers, traders, and processors. A negligible number of the surveyed straddled 2 of the identified classes. In such instances the activity that was more

[2] Questionnaire developed by the FAO contribution to the AAACP Agricultural Commodities Programme titled "An exploratory survey on risk management along the food chains"

significant or intensive was used as the criterion in classification. Given that an objective of the study is the prescription of appropriate strategies for the development/improvement of the cassava value chain, the sample was sub-divided into the identified groups deemed to contain homogeneous cases within but heterogeneous as individual groups.

## 4. Results

The results are discussed from the perspective of two broad areas. These areas are:

1. The risk profile of each identified category in the value chain;
2. Coping mechanisms of each identified category in the value chain.

### 4.1 Farmers

*Farmers' risk profile*

Operators in this category (farmers) are generally not members of professional organizations or producers associations. Only 22% of those interviewed claimed otherwise. Moreover, of the two whom responded in the affirmative, judged on a scale of 'totally ineffective' (1); to 'very effective' (5), only in two instances did responses rank above 2 (3 and 4) in any of the categories indicated in terms of the main services provided through membership in the organization.

As it regards the question of main risks faced in their operation, judged on a scale of 'not important (1); to 'very important' (5), the table below gives an indication of the more prominent risks indicated by operators.

**Table 1: Main Risks in Operation-Farmers**

| Risks in Operation | Rank Percentage | |
|---|---|---|
| | 4 | 5 |
| 1. Sudden changes in output price | - | 50 |
| 2. Sudden changes in input prices | 33 | 44 |
| 3. Prolonged decline in output prices | 44 | 11 |
| 4. Changes in the operation of domestic output markets | 13 | 50 |
| 5. Natural events or disasters | 43 | 43 |
| 6. Pests and disease related risks | 33 | 33 |
| 7. Changes in the final consumer demand | 29 | 57 |
| 8. Others | 44 | - |

Restricting the analysis to only the most extreme situation/'very important' (5) and the situation preceding that condition (4), it can be seen that 50% of those sampled consider sudden changes

in output price to be a main risk in their operations. Sudden changes in input prices features prominently as well. Prolonged decline in output price is also considered important by 44% of respondents but only ranked as being very important by 11% of the respondents. Natural weather events (particularly flooding or extremely wet conditions brought on by heavy rainfall) features prominently likewise is the case of pests and disease related risks which almost exclusively had to do with acushi ants attacks. Changes in final consumer demand, was considered to be very important. This is quite logical, as there is a simultaneous relation between changes in final consumer demand and sudden changes in out price which is considered a very important source of risk for operators in this group. The area of changes in the operation of domestic output market was considered as a very important source of risk. This was so since farmers supply to comparatively fewer purchasers without any contracts or commitments to purchase on the part of these purchasers or traders. In addition, delays, cut backs or even no purchases from the usual traders puts farmers in an extremely vulnerable position. As regards other sources of risks, 44% of farmers found these other sources to be important. The most prominent explanation put forward by operators in this group is the lack of real competition in the market. More precisely, the oligopsonistic nature of the market is viewed as a severe constraint to the proper transmission of signals in price formation.

Regarding the question of stability of operation in terms of future profitability, 56% indicated that their operations would be relatively stable (a ranking of 4) on a scale of 'very unstable' (1); to very stable (5) suggesting an optimistic outlook. When questioned further on this optimism, respondents indicated generally that the new dynamism seen as taking hold in the wider agricultural industry (particularly as it regards the new agricultural diversification and rural enterprises projects being rolled out by the Ministry of Agriculture) as main reasons.

**Table 2: Impact of Risks on Operation of Business-Farmers**

| Impact of Risks in Operation | Rank Percentage 1 |
|---|---|
| 1. The markets in which you sell your products | 67 |
| 2. The sources of finance for your business | 38 |
| 4. The type of goods that you produce or deal in | 56 |
| 5. The way in which you decide on the amount or type of goods that you produce or the modes of production you adopt | 56 |

When asked what type of effect would the risks identified have on their operations; temporarily (1), permanently (2), or there would be no change (3), no significant result was registered for the categories of 'permanently' or 'no change' for none of the identified risks. However, significant results were registered for temporary changes to operation. Table 2 gives an indication of the more significant of these responses. Significantly, 67% of respondents indicated that due to the indicated risks, they would change their markets in which they sell their products. This was expected as market risks appear to be a major concern for this group. The related issues of the type of goods/produce dealt in and the way in which decisions are made regarding the amount or type of goods or modes of production adopted registered identical figures of 56%. Given that operators in this group typically cultivate several crops, it is appreciable that such operators would reorganize resources and efforts to reflect the changing or transient conditions even if cassava is considered a major crop as is the case established in this sample of farmers.

One reason for the noticeable weak responses for permanent changes is that farmers interviewed consider themselves primarily cassava farmers, coupled with physical constraints such as soil type and terrain, they would be to a certain extent locked in or restricted to cassava production as the primary crop. While source of finance for business registered a significant percentage (38%), it was the least amongst the more prominent of these responses. This would have been as a result of the fact that cassava farmers in general finance their crop entirely from personal resources, such as savings. Credit is known to be highly difficult to access for this group and therefore

would not be a real option. Without such options, therefore, there would be little likelihood of the other risks impacting heavily on this aspect.

*Farmers' coping mechanisms*

Operators were asked to rank on a scale of 'totally ineffective' (1); to 'very effective (5), a number of possible risk coping mechanisms. Some of the more outstanding responses of his exercise are highlighted in table 3.

**Table 3: Risk Reducing Mechanisms-Farmers**

| Risks reducing mechanisms | Rank Percentage | |
|---|---|---|
| | **4** | **5** |
| 1. Government policies | 43 | - |
| 2. Wider production mix | 33 | 44 |
| 3. Better infrastructure | - | 80 |
| 4. Investments in new equipment, machinery or better technology | 17 | 67 |
| 5. Informal credit and insurance mechanisms | 43 | 43 |
| 6. Assistance from banks and other credit institutions | 28 | 43 |
| 7. Personal Savings | 11 | 78 |

Personal savings stand out as the main risk reducing mechanisms utilized by farmers. This is primarily so due to the poor access to formalized credit. Better infrastructure is another prominent risk reducing mechanism, albeit one that is exogenous to the farmers' own strategies. Better farm to market roads, for instance, help in mitigating against logistical risks which heavily constrain farmers from being able to diversify their markets. Government policies are similarly exogenous factors that may help in risk reduction. The numerous components of the agricultural diversification and rural enterprise projects that are at present being rolled out by the Ministry of Agriculture are in themselves a manifestation of Government policies. One good example that is evident under these far-reaching projects is the increased emphasis on extension services as well as the encouragement and strengthening of producers associations which help to reduce yield and market risks respectively. Wider production mix, like assistance from banks and other credit

institutions, registered similar results. In the case of wider production mix the results here supports the point made earlier that operators in this group typically cultivate several crops as part of their ex ante risk reducing strategies or ex post in response to poor market conditions from previous crop cycles. This, however, must be viewed from the perspective that constraints such as soil type and general terrain play a significant role in determining the extent to which farmers are able to diversify.

In the absence of adequate access to formal credit facilities, informal credit arrangements are often relied upon. Qualitative evidence suggests that such arrangements are highly exploitative of farmers' situation but nevertheless are relied upon in the absence of viable alternatives. Assistance from banks and other credit institutions relate more to the case of NGO support and revolving funds mechanisms which usually have schedules for some pre-determined time span and which only dispense small loans. A relatively high percentage of farmers indicated that investment in better technology has paid good dividends in mitigating against some of the risks they are exposed to. Better agronomic practices in general but particularly in the area of plant protection was indicated as being highly successful in mitigating against pest attacks.

Regarding the question of how respondents would improve the mechanisms above that do not work effectively, credit was unanimously the area where respondents felt much could be done in creating a much more effective risk coping mechanism. It was articulated by farmers that sorely lacking, is credit of an adequate volume and quality to suit their needs. Given however that agricultural credit provision is problematic and cannot easily be resolved at the local level, it was proposed that the implementation of adequately funded revolving funds which are operated by producers' associations be promoted. In addition, it was pointed out that loans should be crop-specific and therefore loan repayment arrangements established, based on crop cycles and cropping patterns. Further, such revolving funds should have as an important component, provisions for easy credit rescheduling and/or refinancing when warranted such as in the case of floods or extensive pest infestation.

Farmers generally were of the opinion that training can be useful in helping them to deal with the mentioned risks. Some major area of training alluded to are in effective crop protection as well as in the functioning of producers' associations.

None of the farmers interviewed were involved in any contractual agreement. All of them however indicated that contracts would be useful to them in reducing market risks. Similarly, none of the farmers use agricultural insurance in their operations, since there is no agricultural insurance market in Guyana. Like the case of contracts, all the farmers were of the opinion that agricultural insurance would be useful in alleviating the risks in their activity. In as much as no such product exists locally, when the core of the concept was explained to farmers, interesting responses were given for fielded questions regarding potentially limiting factors in accessing agricultural insurance. Based on a scale of 'least important (1); to 'very important' (5), table 4 gives an indication of the more prominent limiting factors put forward by farmers.

**Table 4: Perceived Limiting Factors in Accessing Agricultural Insurance-Farmers**

| Main Limiting Factors | Rank Percentage | |
|---|---|---|
| | 4 | 5 |
| 1. High cost | 25 | 75 |
| 2. Unwillingness of insurance companies to insure operation | - | 50 |
| 3. High risk in operation | 50 | 50 |
| 4. Small scale in operation | - | 60 |

The information embedded in table 4 is suggestive of a pessimistic outlook by farmers regarding applicability of agricultural insurance for their crop. This is so even though the very group has indicated that agricultural insurance would be useful in alleviating the risks in their activity. This revelation no doubt would be an important consideration in the event that crop insurance is to be designed for cassava farmers. The perceived high cost of premiums is indicative of the degree of willingness of farmers to self-finance premiums.

Regarding the subject of credit, short-term working capital loans were most frequently used in their operation. Further, all of those interviewed were of the perception that credit can contribute to the alleviation of risks in their activity yet 78% of those interviewed indicated that they do not use credit. The table below gives an indication for this anomaly based on a scale of 'least important (1); to 'very important' (5).

**Table 5: Limiting Factors in Accessing Credit-Farmers**

| Main Limiting Factors | Rank Percentage | |
|---|---|---|
| | **4** | **5** |
| 1. High interest rate | - | 100 |
| 2. Lack of collateral | 22 | 67 |
| 3. Lack of information on credit products | 11 | 33 |
| 4. Small scale of operation | 25 | 63 |

High interest rate and lack of collateral were put forward as being the most limiting factors in accessing credit. Small scale of operation is perceived by farmers as working to their disadvantage as well in accessing credit.

## 4.2 Traders

*Traders' risk profile*

Membership in professional or producer organizations in terms of numbers in this category like farmers are few. In this case however the two operators whom responded in the affirmative, awarded ranks of 4 and 5 for 'others'. With respect to the specifics of these rankings, the general explanation given was that the membership to the organizations was of an informal nature, and the organization provided a forum for the sharing of information on supplies and markets primarily.

Regarding the question of main risks faced in their operation, judged on a scale of 'not important (1); to 'very important' (5), the table below gives an indication of the more prominent risks indicated by operators.

**Table 6: Main Risks in Operation-Traders**

| Risks in Operation | Rank Percentage | |
|---|---|---|
| | 4 | 5 |
| 1. Sudden changes in output price | 14 | 71 |
| 2. Sudden changes in input prices | 14 | 43 |
| 3. Prolonged decline in output prices | 14 | 43 |
| 4. Changes in the operation of domestic output markets | 29 | 43 |
| 5. Natural events or disasters | 16.7 | 33 |
| 6. Pests and disease related risks | - | 57 |
| 7. Transport failures | - | 57 |
| 8. Changes in final consumer demand | - | 57 |
| 9. Changes in oil price | - | 43 |
| 10. Others | - | 75 |

The table above indicates that operators are typically affected by most of the risks suggested in the questionnaire at their level of the value chain. Sudden changes in the output prices however was the stand out, with 71% of respondents ranking this risk as being 'very important'. This is quite understandable as being traders, having invested their resources through purchases, sudden or unpredictable changes in the price for their commodity results in either substantially reduced profit margins in the case of a price decline or substantial drop off in sales in the case of a price rise. 75% of traders indicated that other risk concerns were very important. The major part of these issues centered on storage, spoilage and in general post harvest matters.

Regarding the question of stability of operation in terms of future profitability, 28% indicated that their operations would be very stable (a ranking of 5) on a scale of 'very unstable' (1); to very stable (5), with a matching percentage awarding a rank of 4. Of even more importance however is that 43% awards the rank of 3 which suggests that the presence of such risks presents fairly serious stability challenges for the future profitability of these traders.

**Table 7: Impact of Risks on Operation of Business-Traders**

| Impact of Risks in Operation | Rank Percentage | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| 1. The markets in which you sell your products | 100 | - | - |
| 2. The suppliers from which you buy your inputs | 71 | 14 | 14 |
| 3. The sources of finance for your business | 43 | 43 | 14 |
| 4. The type of goods that you produce or deal in | 57 | 29 | 14 |
| 5. The way in which you decide on the amount or type of goods that you produce or the modes of production you adopt | 57 | 29 | 14 |

When traders were asked what type of effect would the risks identified have on their operations; temporarily (1), permanently (2), or there would be no change (3), all of the respondents indicated that the risks would have an effect on the markets in which they sell their products. As such traders would be forced to source other markets, at least temporarily. In addition, 71% of the traders indicated that due to the risks identified, suppliers from which cassava is secured are changed temporarily. Traders also indicated that the sources of finance for their business will be changed either temporarily or permanently. 57% of traders surveyed indicated that the risks identified can result in at least temporary change from trading in cassava, and a similar percentage was indicated for the way in which traders decide on the amount of cassava to purchase in each instance temporarily.

*Traders' coping mechanisms*

Operators were asked to rank on a scale of 'totally ineffective' (1); to 'very effective (5), a number of possible risk coping mechanisms. Some of the more outstanding responses of his exercise are highlighted in table 8.

**Table 8: Risk Reducing Mechanisms-Traders**

| Risks reducing mechanisms | Rank Percentage | |
|---|---|---|
| | 4 | 5 |
| 1. Wider production mix | 14 | 57 |
| 2. Better infrastructure | - | 40 |
| 3. Investments in new equipment, machinery or better technology | 40 | 20 |
| 4. Informal credit and insurance mechanisms | - | 60 |
| 5. Assistance from banks and other credit institutions | - | 60 |
| 6. Personal savings | 14 | 57 |

Personal savings, informal credit and assistance from banks and other credit institutions are among the more important coping strategies utilized by traders in the value chain. Unlike the case of farmers, traders have greater access to commercial credit allowing them an additional coping mechanism compared to farmers. Trading in other produce as well serves as a risk mitigating strategy in the face of slumping prices or fall off in sales of cassava. Better infrastructure is referred to in the context of improved storage facilities. Traders indicated that in mitigating risks associated with poor sales and depressed prices, better storage has helped in the short-term to hedge against unfavorable market conditions. A similar explanation is given for investment in better technology which relates to improved post harvest handling.

Regarding the question of how respondents would improve the mechanisms above that do not work effectively, post harvest handling and storage were suggested as the areas where respondents felt much could be done in creating a much more effective risk coping mechanism. Traders indicated that proper post harvest techniques and storage facilities would significantly reduce the risks they are faced by. Training in post harvest handling was identified as a critical area in protecting cassava trading against market risks for traders.

The traders surveyed indicated that they were typically not involved in contractual arrangements for either buying or selling of cassava; but all of them were of the opinion that such arrangements can be useful to reduce risks in their operation. While none of those surveyed have

used agricultural insurance, 71% indicated that they believed some form of insurance could contribute to alleviating the risks in their activity.

**Table 9: Perceived Limiting Factors in Accessing Agricultural Insurance-Traders**

| Main Limiting Factors | Rank Percentage | |
|---|---|---|
| | 4 | 5 |
| 1. High cost | 25 | 75 |
| 2. Lack of information on insurance | 25 | 50 |
| 3. Unwillingness of insurance companies to insure operation | - | 67 |
| 4. High risk in operation | - | 67 |
| 5. Small scale in operation | - | 67 |

Like the case of the farmers, while there is an expressed interest for agricultural insurance, a pessimistic outlook prevails nevertheless regarding applicability of agricultural insurance to their activity. The table 8 gives an indication of traders' perception with respect to insurance judged on a scale of 'least important' (1); to 'most important' (5).

None of the traders surveyed indicated that they used credit but 86% declared that they were of the opinion that credit can contribute to the alleviation of risks in their activities. The table below gives an indication of the limiting factors in accessing credit based on a scale of 'least important (1); to 'very important' (5).

**Table 10: Limiting Factors in Accessing Credit-Traders**

| Main Limiting Factors | Rank Percentage | |
|---|---|---|
| | 4 | 5 |
| 1. High interest rate | - | 83 |
| 2. Lack of collateral | 17 | 83 |
| 3. Small scale of operation | - | 66 |

High interest rate and lack of collateral like the case of farmers were similarly put forward as being the most limiting factors in accessing credit. Small scale of operation is perceived by traders as working to their disadvantage as well in accessing credit.

## 4.3 Millers

*Millers' risk profile*

Given that only two millers were interviewed, the analysis by necessity will be more qualitative in nature.

Regarding the question on main risks faced in their operation, judged on a scale of 'not important (1); to 'very important' (5), the table below gives an indication of the more prominent risks indicated by operators.

**Table 11: Main Risks in Operation-Millers**

| Risks in Operation | Rank Percentage | |
|---|---|---|
| | 4 | 5 |
| 1. Sudden changes in input prices | - | 50 |
| 2. Prolonged decline in output prices | 50 | - |
| 3. Changes in the conditions of finance | - | 50 |
| 4. Changes in the operation of domestic output markets | - | 50 |
| 5. Changes in final consumer demand | - | 50 |
| 6. Changes in oil price | - | 50 |

Restricting the analysis to only the most extreme situation/'very important' (5) and the situation preceding that condition (4), it can be seen that 1 of the surveyed millers (50%) consider sudden changes in input price to be a main risk. Given that cassava is the main input in cassava milling, sudden changes in cassava prices faced by millers constitute a serious threat. Prolonged decline in output prices was less of a concern for millers. Changes in conditions of finance are viewed as relatively important as well. Given that milling operations are generally financed through reinvested profits, late payments for products pose problems for the accessing of raw materials and continued processing. Changes in the operation of domestic output market were considered

as a very important source of risk, given that millers like farmers operate without any formal sales contracts hence delays, cut backs or even no purchases from the usual market puts millers in an extremely vulnerable position. Changes in final consumer demand and oil price were also identified as important risks for millers. In the case of one of the millers interviewed, sales are made to regular purchasers such as supermarkets and when there are fall offs in purchasers by final users, this translates into reduced orders from supermarkets. Regarding the case of changes in oil price, given the relatively rudimentary nature of the technology employed by millers interviewed in this survey, cost of fuel constitutes a major proportion of the overall processing costs. As such, changes in the oil price have very direct implications for the profitability and even sustainability of processing mills.

Regarding the question on the stability of operation, one of the millers indicated a rank of 5 (very stable), while the other indicated a rank of 1 (very unstable). This anomaly may have arisen given that the two mills' sell to vastly different markets.

**Table 12: Impact of Risks on Operation of Business-Millers**

| Impact of Risks in Operation | Rank Percentage | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| 1. The markets in which you sell your products | 100 | - | - |
| 2. The suppliers from which you buy your inputs | 100 | - | - |
| 3. The sources of finance for your business | 50 | - | 50 |
| 4. The type of goods that you produce or deal in | 100 | - | - |
| 5. The way in which you decide on the amount or type of goods that you produce or the modes of production you adopt | 50 | 50 | - |

When asked what type of effect would the risks identified have on their operations, both respondents indicated that the markets in which they sell their products, the market in which they buy their inputs and the types of goods they produce would at least be temporarily changed. In the case of the response to change in markets, risks such as changes in final consumer demand would trigger such a response while sudden changes in input prices have resulted in temporary

changes in suppliers of inputs. In the case of the types of goods produced, in particularly the case of one of the millers interviewed, while there is a variety of cassava based products that can be produced by the mill, production mix is based on supply orders and as such changes in the operation of domestic output markets, and changes in final consumer demand would result in a temporary change on the mills' operations.

*Coping Mechanisms-millers*

Operators were asked to rank on a scale of 'totally ineffective' (1); to 'very effective (5), a number of possible risk coping mechanisms. One of the more important mechanisms highlighted was 'wider production mix'. While millers in the normal course of operation focus on one or a narrow combination of cassava-based products, the expansion of this combination has served as a good risk coping mechanism.

Regarding the question of how respondents would improve the mechanisms above that do not work effectively, capacity building was singled out as crucial to this process. Training in the area of processing, packaging and marketing were identified as critical.

Neither of the millers interviewed were involved in any contractual agreement. Both of them however indicated that contracts would be useful to them in reducing market risks. Similarly, none of the farmers use insurance in their operations since there are no such insurance products locally. Like the case of contracts, both millers were of the opinion that agricultural insurance would be useful in alleviating the risks in their activity. As it regards fielded questions surrounding potentially limiting factors in accessing agricultural insurance, based on a scale of 'least important (1); to 'very important' (5), table 13 gives an indication of the more prominent limiting factors put forward by these millers.

**Table 13: Perceived Limiting Factors in Accessing Insurance for Operations-Millers**

| Main Limiting Factors | Number of Millers by Rank | |
|---|---|---|
| | 4 | 5 |
| 1. High cost | 1 | - |
| 2. Lack of information on insurances | - | 1 |
| 3. Contract is too complicated | 1 | - |
| 4. Lack of appropriate insurance products | - | 1 |
| 5. Unwillingness of insurance companies to insure operation | - | 1 |
| 6. High risk in operation | - | 1 |
| 7. Small scale in operation | - | 1 |

Like both of the other groups (farmers and traders), there is a degree of pessimism associated with insurance for their operations. At least one of the millers surveyed indicated a high ranking (4 or 5) regarding perceived limiting factors in accessing insurance for its operations.

Regarding the subject of credit, only one of the millers used credit. Short-term working capital loans were most frequently used in operation. One of the millers disclosed that loans were accessed through a revolving fund and both of the millers interviewed were of the opinion that credit can contribute to the alleviation of risks in their activity. The table below gives an indication of the main limiting factors in accessing credit based on a scale of 'least important (1); to 'very important' (5).

**Table 14: Limiting Factors in Accessing Credit-Millers**

| Main Limiting Factors | Number of Millers by Rank | |
|---|---|---|
| | 4 | 5 |
| 1. High interest rate | - | 2 |
| 2. Lack of collateral | - | 1 |
| 3. Lack of information on credit products | 1 | 1 |
| 4. High risk of default in my operation | 1 | 1 |
| 5. Small scale of operation | - | 1 |

High interest rate was put forward as being the most important limiting factor in accessing credit with others factors listed in the table considered to be roughly of equal importance.

## 5. Conclusions and Recommendations

The primary objective of this study has been that of analyzing the status of risk management and finance along the cassava value chain in Guyana and that of suggesting ways for the enhancement of the existing risk management mechanisms in view of the likely developments in the industry.

Overall, the results indicate the inability on the part of operators to cope with specific risks at the individual levels of the local cassava value chain.

The following important observations can be drawn from the study:

1. Use of contracts by operators in the value chain is restricted to at best to loose, non-binding arrangements;
2. Due to the under-developed state of the cassava value chain, options are relatively narrow in coping with the more serious risks operators are faced by.

Starting with the category of farmers, generally the main risks that this category is faced by are market and production risks. In the case of market risks, changes in the output price, prolonged decline in output price, changes in the operation of domestic output markets and changes in final consumer demand are all major risk factors for farmers. The presence of such risks, result in farmers temporarily changing the market in which they sell their cassava, and diversifying into other crops. As it regards production risks faced, pest attacks are the most prominent. The coping strategies most used are the diversification into other crops aimed at nullifying some of the adverse output market conditions and the application of more rigorous agronomic practices such as improved plant husbandry in coping with pests. Personal savings were singled out as an important coping strategy across the major risks experienced by farmers. Farmers are particularly vulnerable to the market risks as identified given the absence of contracts. The nature of marketing arrangements between the farmers and purchasers are almost exclusively void of any legally binding agreement; a situation which only exacerbates the risks faced by farmers.

Traders like the farmers, are prone to market risks (particularly sudden changes in input price). Unlike the case of farmers, the use of sales contracts would be of less importance given that a

sizeable proportion of the cassava sold is in relatively small amounts to numerous retailers. Poor storage and generally post harvest handling constitute a significant source of risk for traders as any changes in market demand results in either a build up in stocks requiring additional storage and increased risk for spoilage, while reduced demand in the market equally results in longer storage time and by extension increased risk of spoilage. As it regards the impact on operations of the traders as a result of the risks exposed to, strong evidence exists that traders typically are forced to temporarily seek different markets for both sales and supply. The presence of the identified risks also results in temporary changes from trading in cassava to other ground provisions, and generally on the quantity of cassava traded relative to other provisions traded in. Implied in the temporary changes indicated, the trading in a wider mix of products is a major risk reducing mechanism employed by these traders. Use of informal credit and personal savings in times of unfavorable market demand are additional mechanisms employed. Very often traders may supply smaller retailers on credit. When demand is sluggish in the retail market payments may take protracted periods to be honored and therefore traders would access small informal loans or dip into private savings and access overdrafts at formal institutions to finance their trade.

Regarding the case of millers, this category in the value chain is affected by sudden changes in input prices, changes in final consumer demand and changes in the operation of the domestic output market particularly. Given the sub-optimal scale of operation of the mills captured in the survey, profits are squeezed, and sudden rises in price of main input such as cassava and petrol pose severe risks for the group. In addition given that supply of processed product is very often on credit terms, this exposes the millers to late payments. In light of these risks, millers are typically forced on a temporary basis to seek other markets for their products, temporarily source inputs from other suppliers and temporarily change production mix. Wider production mix is identified as a particularly important coping mechanism for the millers.

Resulting from the dissection of the observations made above, the following specific recommendations are proposed as it regards the improvement of risk management and finance along the cassava value chain in Guyana:

1. The creation and/or strengthening of farmers' marketing organizations with the mandate of marketing the collective output of farmers in its organization and through which prices and quantities are negotiated with traders. Such an arrangement will create the incentive for farmers to expand cultivation and take the necessary measures to improve yields as a result of more stable markets and improved prices;

2. The designing and implementation of contractual farming and/or legally binding contractual arrangements in the marketing of farmers' fresh cassava. Such an arrangement has the potential of serving as a vital instrument in the stabilization of prices offered to farmers while at the same time ensuring stable delivery quantities which can only contribute to improved production planning on the part of farmers;

3. The encouragement and creation of appropriately-equipped and scaled, strategically located post-harvest storage facilities to serve traders in cassava. These facilities may be established and run by traders with the necessary technical assistance from relevant agencies. Such an initiative will aid in significantly reducing spoilage and storage challenges experienced at present by traders.

4. The establishment and improvement in the operations of more commercially scaled cassava processing plants either through community-type undertakings or private undertakings catering to an expanded mix of products such as starches, feed, cassava flour to be used as composite with wheaten flour, bio-fuel and other traditional food preparations. The larger manufacturing/industrial centers in Regions 1, 2, and 9 (Cluster 1)[3] can possibly concentrate on starches, cassava flour to be used for composite flour, and livestock feed (particularly poultry), while the traditional food preparations such as farine, casareep, as well as bio-fuel which can be used to generate electricity for small communities, can be the focus in Regions 3, 4, 6 and 10 (Cluster 2). It is envisaged that such processed products can be sold to miners in the mining communities and in the case of bio-fuel, such an operation can be community operated. Livestock feed can possibly

[3] Clusters were used to categorize groups cassava farming regions in Guyana on a number of criteria. See study titled "The Actual and Potential Market for Cassava in Guyana".

be included in Cluster 1 as well. The creation of large-scaled cassava processing would provide a ready market for expanded cassava output and create opportunities for value-addition through stability in prices which possibly can feed back to cassava farmers. Moreover, the establishment of commercially scaled processing operations which cater to an expanded product mix will contribute significantly to reduction in market risk as such processing facilities with their wider product mix capabilities would allow for more fine-tuned diversification of production, as a risk coping strategy for millers.

5. The designing and implementation of revolving funds to serve the credit needs of all operators identified in the value chain (farmers, traders and millers). These revolving funds should be designed specifically for individual groups with the necessary provisions made for the specific nature of the operations of each category of operators.

6. The implementation and enhancement of innovative and structured capacity building schemes specifically tailored to the needs of operators in the value chain. It is inconceivable that any of the recommendations would effectively be implemented and ultimately prove to be sustainable without the direct involvement of the main stakeholders; the operators in the value chain, at every stage of the process (planning, implementation, execution). In order however for the value chain operators to be capable of being integrated in the process, they would need to be exposed to the necessary training. Areas of training such as processing, packaging and basic marketing are crucial in this respect.

This study has provided a general assessment of risk, its management and finance along the cassava production chain in Guyana. .Despite its limitations arising the absence or limited use of a number of instruments such as producers' organization and insurance, it allowed gaining insights on interventions and strategies to be adopted to address the undeveloped state of cassava production. Actions highlighted would need to be further qualified through cost-benefit analyses particularly for those recommendations having to do with the establishment of post-harvest handling facilities, revolving funds, and the proliferation of commercially scaled mills.

# APPENDIX 1

## An Exploratory Survey on Risk Management along the Cassava Value Chain in Guyana

## Questionnaire

**1.**

What is your activity within the value chain?

–farmer □

Please list all the main crops and livestock products that you produce, starting with the most important in terms of income

What is the total acreage of your farm? _____

Do you market your products? – *Part of it* □ what percentage? _____

– *All of it* □

–processor □

–trader □

–retailer □

–bank □

–insurer □

–agricultural input supplier (please specify which input(s)) _____ □

–other, please specify_____ □

**2.**

Are you a member of any professional organization or producer association?

Yes □

No □

If yes, what are the main services this organization provides? Please rank them in terms of effectiveness (1=totally ineffective, 5 = very effective)

| | | | | | |
|---|---|---|---|---|---|
| –aggregation of supply and commercialization | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| –contractual arrangements with food processors, retailers, exporters | | | | | |
| | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| –information and training | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| –extension services | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |

–other (please specify) _____

| | | | | | |
|---|---|---|---|---|---|
| | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |

**3.**

What are the main risks of your operation?

Please rank them from 1 to 5 according to their importance

*1=not important 5= very important*

| | | | | | |
|---|---|---|---|---|---|
| • sudden changes in output price | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • sudden changes in input prices | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • prolonged decline in output prices | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • changes in the operation of input providers | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • changes in conditions of finance | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • changes in the operation of domestic output markets | | | | | |
| | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • natural events or disasters, such as hurricanes, floods or others (please specify)_____ | | | | | |
| | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • pests and diseases related risks | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • transport failures | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • distribution failures | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • change in Government policies | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • changes in foreign market conditions | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • changes in the final consumer demand | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • changes in exchange rates | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • changes in oil prices | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • Others, please specify _____ | | | | | |
| | □ | □ | □ | □ | □ |

**1 2 3 4 5**

**4.**

How stable do you think your operation is in terms of future profitability?

*Very unstable* *very stable*

□ □ □ □ □

**1 2 3 4 5**

**5.**

Would the presence of such risks affect permanently or temporarily your way of doing business? For instance, would you change:

- the markets in which you sell your products? □ □ □
  *temporarily* *permanently* *no change*
- the suppliers from which you buy your inputs? □ □ □
  *temporarily* *permanently* *no change*
- the sources of finance for your business? □ □ □
  *temporarily* *permanently* *no change*
- the type of goods that you produce or deal in? □ □ □
  *temporarily* *permanently* *no change*
- the way in which you decide on the amount or type of goods that you produce or the modes of production you adopt? □ □ □
  *temporarily* *permanently* *no change*
- Other, please specify_____
  □ □ □
  *temporarily* *permanently* *no change*

**6.**
What are the mechanisms that help you reduce risk in your operations?
Please rank them from 1 to 5 in terms of effectiveness
*(1=totally ineffective, 5=very effective)*

- Government policies □ □ □ □ □
  **1 2 3 4 5**
- wider production mix □ □ □ □ □
  **1 2 3 4 5**

- conditions specified in business contracts in which you are involved, for either buying/selling inputs or buying/selling outputs □ □ □ □ □
  **1 2 3 4 5**
- better infrastructure such as better roads, utilities, telecommunications, storage facilities
  □ □ □ □ □
  **1 2 3 4 5**
- investments in new equipment, machinery or more advanced technology
  □ □ □ □ □
  **1 2 3 4 5**
- informal credit and insurance mechanisms (friends, extended family)
  □ □ □ □ □
  **1 2 3 4 5**
- formal insurance contract □ □ □ □ □
  **1 2 3 4 5**
- assistance from banks or other credit institutions
  □ □ □ □ □
  **1 2 3 4 5**
- personal savings □ □ □ □ □
  **1 2 3 4 5**
- sale of assets □ □ □ □ □
  **1 2 3 4 5**
- production contracts □ □ □ □ □
  **1 2 3 4 5**
- commodities exchange □ □ □ □ □
  **1 2 3 4 5**
- others (please specify)_____
  □ □ □ □ □
  **1 2 3 4 5**

**7.**
Please describe briefly how you would improve the mechanisms above that do **not** work effectively

**8.**
If you think that more information or training could protect your activity against the mentioned risks, please specify the topic (s).

**9.**
Are you involved in any contractual agreement, for instance for selling/buying products or inputs, or both?

*Yes* □ *No* □

If **yes**, how is this organized? Please describe briefly
_____

**10.**
Did you ever have problems in enforcing the above-mentioned contracts?

*Yes* □ *No* □

If **yes**, please specify what difficulties?
If you are **not** involved in contractual agreements, do you think that such arrangements could be useful to reduce risk in your activity?

*Yes* □ *No* □

**11.**
Do you think that an insurance could contribute to alleviating the risks in your activity?

*Yes* □ *No* □

**12.**
Please list the insurances that you use in your operation, if any

**13.**
What are the major limiting factors in accessing insurance? Please rank them from 1 to 5 in terms of importance.
*(1=least important 5=most important)*

| | | | | | |
|---|---|---|---|---|---|
| • high cost | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • lack of information on insurances | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • contract is too complicated | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • lack of appropriate insurance products | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • unwillingness of insurance companies to insure my operation | | | | | |
| | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • high risk in my operation | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • small scale of my operation | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |

**14.**
Do you think that credit can contribute/contributes to the alleviation of risks in your activity?

*Yes* □ *No* □

**15.**
Do you use credit?

*Yes* □ *No* □

If yes, please list the credit products that you more frequently use in your operation

**16.**
What are the major limiting factors in accessing credit? Please rank them from 1 to 5 in terms of importance *(1=least important 5=most important)*

| | | | | | |
|---|---|---|---|---|---|
| • high interest rates | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • lack of collateral | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • high transaction costs | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • lack of information on credit products | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • high risk of default in my operation | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |
| • small scale of my operation | □ | □ | □ | □ | □ |
| | **1** | **2** | **3** | **4** | **5** |

**17.**
What type of collateral you are requested to provide? Please specify