

Structured Agriculture Input Finance Product Challenges in Uganda: A Case of Standard Chartered Bank

Patrick Ocailap Enotu¹ Nixon Kamukama² Bazinzi Natamba^{*3}

Abstract

This study was necessitated by the failed takeoff of Structured Input Financing (SIF) product in Standard Chartered Bank Uganda Limited. This is a pre-harvest product designed to ease access to financing of farmers based on reliance on underlying transaction and the strength of the value chain linkages between farmers and the impeccable, reputable and bankable corporate or institutional buyers. The study sought to address: Challenges inhibiting the take off of SIF, to assess the level of awareness of the stakeholders towards availability of SIF, to assess the suitability of SIF in Ugandan Market, and to come up with strategies to address challenges impeding the success of SIF in Standard Chartered Bank Uganda Limited. To undertake this study, the entire population (65 employees) employed during the study period in corporate department covering business units; OCC, TB, and FM as well as operations department (T&O) were considered. The questionnaires were distributed to all these staff, collected and analyzed. The findings revealed that most of the respondents were from the corporate department with working experience ranging from 5-10 years. A significant number of respondents agreed that the fundamentals are ripe for SIF given growing commercial agriculture and the structure of Uganda's economy, committed workforce and the revenue potential it presents to the bank. It was also revealed that absence of skilled personal, insurance and inadequate government support was affecting the ability of the bank to competitively offer this product. The study concluded that due to the special nature of SIF the bank should tailor interventions geared at; creating awareness, training of staff and improving risk mitigation through sharing and/or partnerships with government, insurance and other stakeholders. Findings can help management to intensify initiatives to encourage greater understanding and acceptance of the concept of structured finance and how commercial banks can be help agriculture sector to develop in Uganda.

Keywords: Structured, Agriculture, Input finance, Product challenges and Standard Chartered Bank

INTRODUCTION

Financing of agriculture and agribusiness has always been difficult as a result of the inherent risks and nature of the business. Traditional forms of collateral are often not available, thus limiting access to bank credit to the sector. In a bid to reduce reliance on traditional forms of collateral, banks have innovated new types of products that take into account the collateral of the underlying products, processes, the strength of the agricultural value chain and the parties involved in it. Such bank products are termed as structured products – essentially requiring specialized credit appraisal process.

Structured Finance (SF) is broad and is descriptively defined as the advance of funds to enterprises using certain types of security that are not normally accepted by banks or investors and which are more dependent on the structure and performance of the transaction, rather than the characteristics (e.g. creditworthiness) of the borrower Michael Winn et al, (2009).

The major categories of SF include Lending secured by; financial assets such as the assignment of future payment streams with more or less predictable cash flows (e.g., receivable-backed financing, factoring, forfeiting, etc.), physical assets forming in part the underlying commodity transactions (e.g., warehouse receipts financing, Structured input finance, repurchase agreements, etc.), Securitization techniques based on selling claims on physical or financial assets on secondary markets (asset-backed securities, loan portfolios, accounts receivables, etc.).

The focus of this research is Structured Input Finance (SIF) which is part of a wider structured warehouse receipts financing. SIF relies on the strength of the more bankable participants in the value chain such as Exporters, Manufacturers or Diversified Marketing conglomerates with stronger financial history and position than the farmers. Value chain linkages involve contractual commitments to ensure compliance which in turn constitutes the basis for financiers to provide SIF. SIF does not have the reliance on traditional collateral to cover for risk, but rather relies upon collateral substitutes and future income flows normally guaranteed under contract.

¹ Patrick Ocailap Enotu, MBA, ACCA, is currently an employee of Standard Bank-South Africa. His research interests are in the area of agriculture financing in Developing Countries.

² Nixon Kamukama, PhD, is a senior Lecturer, Department of Accounting, Makerere University Business School, Uganda. Dr. Kamukama's is teaching and research interests are in Finance and Accounting and intellectual capital.

³ Bazinzi Natamba, MSC, is a Lecturer, Department of Accounting, Makerere University Business School, Kampala-Uganda. His Teaching and research interests are in finance and accounting, taxation and fraud management. He can be contacted on bnatamba@mubs.ac.ug or natambaa@yahoo.com

Agriculture is a source of livelihood for over 70% of Uganda's population and contributes 15.1% of real GDP (2009/10) Financial Year (Background to the Budget, 2009/10). Despite agriculture being a backbone of Uganda's economy and Government's efforts to improve household income through modernization of agriculture, credit extended to agriculture generally, continues to decline (Background to the budget 2009/10). The use of SF is one of the key innovations devised by banks to facilitate and increase access to production finance which would otherwise not be possible under normal conventional lending. Standard Chartered Bank Uganda Limited's SIF product is one such product meant to increase the bank's lending to agricultural sector but has since remained largely unutilized since inception. The purpose of the study was to examine the challenges of Structured Agriculture Input Finance (SIF) product in Standard Chartered Bank Uganda Limited and come up with strategies that can help resolve the challenges inhibiting growth of this product.

The findings of the study will assist in the development of strategies necessary for takeoff of structured input finance product in standard Chartered Bank in particular and the banking industry in general. The findings will contribute and add useful information to support the banks efforts re-alignment of systems and processes to better support SIF.

LITERATURE REVIEW

It is an uncomfortable reality in many developing countries structurally reliant on agriculture that risk management techniques in the sector are either underdeveloped or insufficient for financial institutions to efficiently extend credit to the agricultural sector. Insufficiency or absence of information on borrowers' credit histories compound information asymmetries that make accurate credit risk assessment difficult. While the farmer's major assets are production and land, it is often difficult for banks to use these as collateral, and particularly difficult to foreclose on land in case of default. Besides the lack of traditional collateral is the presence of a high degree of covariate risk, in particular market price risk and weather risk, banks lending to agricultural clients are faced with the reality that revenues easily drop below break-even levels due to weather vagaries and downside price movement, which result in defaults and higher loan loss provisions.

The second major constraint in agricultural lending is high transaction and supervisory costs due to the unique risks, nature, and characteristics of the agricultural sector. In all financial markets, there is a trade-off between minimizing loan default and supervisory costs, but the nature of agricultural lending, especially through microfinance institutions, makes transaction costs and supervision costs disproportionately high relative to its urban counterpart. The small size of seasonal agricultural credit results in high due diligence costs per loan. The large geographical spread of customers, coupled with poor transportation and communication infrastructure, increase supervisory costs for financial institutions and compliance cost for customers.

The lack of adequate financial services can also be partially attributed to the rapid disengagement of Government as the primary source of agricultural lending in many post liberalization economies. When public sector banking institutions began pulling out of lending or changing their nature of operations, the private sector was expected to take over and offer credit in rural areas. But in many developing countries this space has not yet been filled (World Bank, 2005). These factors combine to limit the supply of rural financial service in general and agricultural finance in particular.

Financial institutions recognize this challenge and have been forced to innovate new products to reach farmers and better manage risks. There is a great deal of enthusiasm in agricultural value chain approach as an additional tool to tackle the stubborn agricultural finance problem, USAID/ AMAP, (2005). Wittlinger and Tuesta (2006) reported on how favorable production, price and value chain organization in Paraguay permitted banks to successfully lend to soybean farmers. Fries and Akin, (2004) argue that continuous innovations by financial institutions through analyzing the products, the constraints and distortions they confront through a product market orientation is expected to yield insights into the challenge of supplying rural financial services beyond what can be learned in a typical financial systems analysis. Gonzalez-Vega, et al (2006) reported on how the emergence of production contracts between Supermarkets and farmers increased the farmers' credit worthiness and as such improved extension of formal loans to help finance the production costs involved in fulfilling such contracts.

Structured Finance (SF)

Structured Finance (sometimes referred to as Value chain Finance), as defined in this document, excludes straightforward bank finance, based on balance sheet lend or the use of conventional collateral, such as land or buildings. Instead, it relies on collateral that is inherent in the transaction itself, such as future receivables. Structured Finance is a broad term encompassing many possible financial instruments, many of which may be used individually or combined with conventional finance and/or other SF instruments. It moves the opportunities for financing beyond companies with acceptable credit risks and offers lower costs for financing.

SIF in Standard Chartered Uganda Limited is part of broader Warehouse Receipt Finance products that focuses on the value chain of the underlying transaction to be financed and not on the credit standing of the borrower as in conventional banking based on the traditional credit appraisal (such as the five "Cs" of character,

capacity, capital, collateral and conditions). It assesses the performance (i.e., risks, profitability and cash flow) of the underlying transactions to be financed. Whereas traditional bank lending is based on a direct relationship between the bank and the borrower, several parties are involved in SIF. Depending on the type of transactions, there may be different actors in agricultural value chains (input suppliers, traders, processors, exporters, warehouses, transporters) or specialized financial services providers (factoring, guarantee or leasing companies). A key strength is the familiarity of the players in value chain with each other. Sound value chain relationships support the promotion and development of effective financing arrangements. These relationships are critical to assist in finance extension as they improve risk mitigation through sharing of risks among various actors and transferring defined risks to those parties that are best equipped to manage them.

Structured Finance and the agricultural value chain

The increased integration within agricultural value chain has raised potential for financing to the sector. Quirós, R. (2007) observes that since Agricultural Value Chain Finance Conference in 2006, two major phenomena have affected agriculture. First was the 2008 food crisis which turned attention to the need for increased investment in agriculture. Second was the 2008-09 financial crisis which lowered the availability of financing available to all sectors, both from the loss of banks' financial assets, an increase in required reserves and a reluctance to borrow or requirement of additional collateral in order to lend. Hence, the use of value chain or SF products and processes as collateral has become more important than ever. The governance and adherence by the players to commitments within the agricultural value chain are also critical. A survey by FAO (2007) in Latin America demonstrated that 50 percent of the regulated financial institutions sampled required their agricultural clients to have formal sales contracts and 39 percent requested clients to be part of a value chain. Strong chains, with clearly defined linkages between the parties represent a powerful framework for structuring finance. Miller & da Silva, (2007) noted that the influence of market competitiveness and market risk on the value chain is promoting access to finance through SF related products. The market dynamic (price, quality, time) are forcing collaboration among players in the agricultural value chain as firms seek to create backward and/or forward linkages.

Challenges to Structured Finance

One of the challenges to financing agriculture is poor governance at farm level which makes it difficult for farmers to perform under contract. According to Pelrine et al (2005) governance challenges rendered Uganda Oilseeds Producers Association (UOSPA) sunflower seed project unviable. UOSPA lent donor funds to the millers so they could expand their businesses and offer loans to farmers. However, because of rampant side selling, it was reported that almost all the funds were lost resulting into perpetrating undercapitalization among processors, poor quality and quantity. Pelrine et al (2005) also noted that some of the sunflower farmers in Northern Uganda breached contracts with Mukwano. Mukwano Industries as one of the largest manufacturers of edible oils in Uganda has in the recent past adopted import substitution strategy through promotion of local sunflower production; it signs contracts with farmers at the beginning of the growing season stipulating the minimum prices that will be paid for sunflower seeds meeting the minimum quality standards. Farmers agree to deliver their crop at harvest, but there have been reported cases of side selling thereby jeopardizing on contractual obligations and trust in the value chain.

Information asymmetry in understanding the agricultural value chain still presents enormous challenge to all the actors. Villeda and Hansel (2005) argued that a value-chain analysis conducted with a financial services lens is an analysis "that pays attention to the role of financial services within value chains, rather than solely within financial systems" (p.15), but did not define what such an analysis might be composed of. Rodolfo Quiros (2007) noted the challenges of lack of proper regulation, governmental intervention and lack of adequate infrastructure such as warehouses. The importance of warehouse receipts with reliable warehouse management companies and functioning commodity exchanges is highlighted as mechanisms that facilitate reduction of price risk through hedging by futures and forward contracts and through reduced losses and costs through effective commodity management.

STUDY DESIGN AND METHODOLOGY

The study adopted a cross sectional survey. This was appropriate because it enabled the researcher to concentrate on the departments responsible for performance of SIF product in Standard Chartered Bank. The study focused on all the staff that existed in corporate department at the time of the study comprising business units: Origination and Client Coverage (OCC), Transaction Banking (TB), Financial Markets (FM) and the operations unit (T&O) that supports SIF transaction processing. The relatively small size of the population enabled the researcher to study the entire population. The study also used both primary and secondary data. Primary data were collected from the employees of the bank. Secondary data was got through relevant literature review from publications such as the audited financial reports, journal articles, textbooks and other related publications. The researcher developed questionnaire and ensured that it covered the study questions. The justification for a tailored questionnaire is that it enabled precise and concise data needs of the study and avoided the redundancies

that could have arisen out of an adopted questionnaire. Data was cross-tabulated to show the different variables. The entry of data was done using Epi-Info version 6.04b statistical package after data was entered and analyzed using a statistical package for social scientists (SPSS version 17). This generated frequency tables for socio-economic and demographic data, taking into account the challenges of SIF products to standard chartered bank. In addition, the researcher was seeking approval from the management of Standard Chartered so as to ease the access and acceptability of the respondents. The validity of the study instruments were performed using the Content Validity Index (CVI). The researcher distributed the questionnaires to banking experts to rate the relevance of questions. The CVI for all the experts was above 0.5, then, the questions were all considered relevant.

RESULTS

Sample Characteristics

The results showed that majority of the respondents had attained bachelors' degree (41.5%). Of these, 63.0% were females and 37.0% were males. Respondents who had attained postgraduate level of education followed (40.0%). Of these, 61.5% were females and 38.5% were male counter parts. It was observed that the minority of the respondents were diploma holders representing 18.5% in the sample. Of these, 83.5% were males and only 5.7% were females. Cross tabulation results also revealed that the majority of the respondents were females (53.8%) while 46.2% of the respondents were males (46.2%). The results also indicated that majority of the respondents had attained Bachelor's degree level of education (41.5%). Of these, 85.2% had served for the period of 5-10 years and only 14.8% had worked longer than 10 years. Respondents who had attained postgraduate level of education followed (40.0%). Of these, 61.5% had worked for the period of 5-10 years and 38.5% had worked longer than 10 years. It was also observed that the minority of the respondents were diploma holders' level of education representing 18.5% in the sample. Of these, 66.7% had worked in the firm for the period of above 10 years and only 33.3% had served for the length of above 10 years.

The results further indicated that majority of the respondents were from Origination & Client Coverage (OCC) department constituting 73.8% and the rest were from the Technology & O Operations (T&O), Transaction Banking (TB) and Financial Markets (FM) department comprising 9.2%, 7.7% and 3.1% respectively. Generally the sample was dominated by respondents who had worked for the period of 5-10 years constituting 66.2% and only 33.8% had served for longer than 10 years in the sample.

Challenges inhibiting the take off of the structured agriculture input finance

The findings revealed that respondents reported a disagreement that they employ experienced people in agriculture financing department as shown by the Mean of 1.71 and SD of 0.67. Findings further revealed that Structured Agriculture Input Finance product (SIF) usually does not require unique agreements to be drawn as indicated by the mean of Mean of 1.66 and SD of 0.77. It was also observed that one of the challenges inhibiting the take off of SIF is that they usually do not lend to both existing customers (Mean = 1.62, SD = 0.49) and out growers (Mean = 1.57, SD = 0.77). Findings indicated that Standard Chartered Bank to a large extent would rely on the services of insurance companies to secure SIF (Mean = 2.20, SD = 0.72). In addition, the respondents believed that there is relatively fair documentation Procedures as shown by (Mean = 1.51, SD = .50). It was also noted that Sales teams do not depend on the opinion of subject matter experts as shown by the Mean of 1.80 and SD of 0.77. There was a reported disagreement about the hire of experts to draw documentation relating to SIF product (Mean = 1.66, SD = .78).

Assess the level of awareness of the stakeholders towards availability of SIF

Results revealed that majority of the respondents strongly disagreed on whether customers get the necessary explanation on all the procedures about SIF product regularly (Mean=1.26, SD =0.44). It was also discovered that the Bank does not regularly visit their customers as indicated by the Mean of 1.32 and SD of 0.71. The findings also revealed that Standard Chartered Bank doesn't usually carryout advertisement about SIF product as shown by the Mean of 1.37 and SD of 0.52. The findings further indicated that SIF customers aren't aware about the prices as indicated by the Mean of 1.37 and SD of 0.65. It was also observed that respondents disagreed about having field staff near to customers that are involved in agriculture as indicated by Mean of 1.58 and SD of 0.79. The results further indicated that SIF customers aren't aware about this product as shown in table 10 (Mean = 1.54, SD = .77). The results also indicated that Standard Chartered bank usually doesn't receive any assistance from government towards extending agriculture loans to farmers (Mean = 1.65, SD = .82). It further noted that the Bank often doesn't hold workshops for their customers as shown by the Mean of 1.63 and SD of 0.78. Respondents further reported disagreement giving information to other stakeholders (Mean = 1.88, SD = .79), in addition the results further noted that sometimes the bank doesn't get feedback from our customer (Mean = 1.72, SD = .84). Results from the survey generally revealed low levels of awareness towards availability of SIF.

Assess the suitability of SIF in Ugandan

Findings revealed that most of the respondent strongly agreed that our economy largely depends on agriculture (Mean = 4.88, SD = .33). It was also discovered that the bank revenue has been increasing as shown by table

13 (Mean = 4.58, SD = .50). The findings also confirmed that Standard Chartered bank always have a committed workforce (Mean = 4.57, SD = .56). Furthermore, the respondents reported a strong agreement about their customer base increase (Mean = 4.20, SD = .73) and having an enabling regulatory environment (Mean = 4.20, SD = .85). It was also discovered that the bank has enough funds to lend under this product (Mean = 4.26, SD = .87) and the respondents also agreed to sometimes getting support from other stakeholders (Mean = 4.05, SD = .93) and we have experienced staff to handle this product (Mean = 4.43, SD = .59).

However, the results reported a disagreement that prices are competitive is indicated by the Mean of 1.51 and SD of 0.85. The findings further revealed that largest customers were not the out growers (Mean = 1.63, SD = .72).

Strategies to address the challenges inhibiting take off SIF

Results indicated that there is need to carry out more training of our staff (Mean = 4.63, SD = .49), involve government and related organizations to ease lending to agriculture sector (Mean = 4.65, SD = .48) and the need of the services of professionals (agronomists, meteorologists) to our support credit process (Mean = 4.54, SD = .71). The findings further revealed that there is need to work closely with farmer groups and lend to corporate as shown by the Mean of 4.51 and SD of .50. There is also a need to identify and partner with insurance service providers as shown by the results (Mean = 4.42, SD = .58). The results also indicated that there is need to increase awareness and advertisement of this product (Mean = 4.42, SD = .58) and need to hire additional staff (Mean = 4.32, SD = .49) as significant strategies to address the identified challenges.

DISCUSSIONS, CONCLUSIONS & RECOMMENDATIONS

Population Characteristics

It was established that 53.8% of the respondent were female and 46.2% were male. The study also discovered that 41.5% of the respondents had bachelors' degree and of these, 63.0% were females and 37.0% were males. The research further revealed that 40.0% of the respondents had attained post graduate education, of these, 61.5% were females and 38.5% were male. As evidence from the findings above, the number of female employees as well as their level of education far exceeded that of their male counterparts.

It was also observed that most of the respondents were in OCC Department as evidenced by 73.8% score. This implies that respondents were either Relationship Managers (RMs), Credit Analysts (CAs), and Product Specialists (TB or FM) were relatively few, 9.2% and 7.7% respectively. The study therefore concentrated on the Departments and individuals responsible for the sales, marketing and approving of SIF credit facilities for corporate clients.

On the length of service, 66.15% of the respondents had worked for the period of 5-10 years, while those that had worked for more than 10 years was 33.85%. This observation demonstrates that most of the respondents were senior employees and experienced bankers.

Absence of information and knowledge

Challenges inhibiting the take off of Structured Input Finance (SIF) Product in Standard Chartered Bank Uganda Limited indicated that there was absence of information, heavy reliance on insurance and subject matter experts are crucial limitation to the success of SIF. The study also noted that government is disengaged and not involved in guaranteeing financing to agriculture under SIF. The respondents strongly disagreed that information about SIF was readily available as evidenced by the low score of 48%. Absence of information implies that there is limited knowledge about the product, its related risks and strategies to mitigate identified risks. These findings are consistent with Langenbucher (2005) who argued that some financial institutions, lack technical knowledge to evaluate and analyze the creditworthiness of agribusinesses value chain. And that this affected their ability to offer specialized products that better meet the financing need of the agricultural sector. The failure to thoroughly understand the client needs at banks' level spells doom as it results into mismatch of time of loan repayments and time receipts of sales post harvest. Available of information is useful in structuring the facility tenors, repayment, and risk management.

Heavy reliance on insurance or third party guarantees to lend

The nature and structure of agriculture make it extremely risky and forces commercial banks to seek to spread risk through partnership with other players in agricultural value chain. Typically, as it is the norm in SIF or other specialized agribusiness facilities, commercial banks mostly seek to spread risk and/or risk share or improve risk monitoring through partnerships with insurance or the third parties acceptable to the banks. These study findings confirm that 72% of the respondents strongly indicated the need for insurance while 50% were concerned about the limited role of government in providing guarantees to support SIF offerings. SIF as a pre-harvest financing product is granted on the basis of the strength of the value chain and indeed on the comfort that the farmer will perform against the pre-agreed contract (supply quantity, quality in accordance with contract terms). Exogenous factors such as pests and diseases, weather vagaries, and wild fires that would affect the quantity, quality and timing of the harvest need to be insured against. Therefore the ability of any bank to extend credit under SF product is largely influenced by access to competitive multi-peril insurance or indeed third party guarantees

(Government, Donors etc) geared towards mitigating performance risk of the farmer.

Studies elsewhere revealed that Mexican farmers, just like in Uganda experienced limited access to formal agricultural credit due to tight liquidity in general and lack of traditional collateral that would be acceptable to the banking sector. However, in 1961 the Mexican Government established a public agricultural insurance program to provide multi-peril risk insurance to all farmers that received credit from the official development bank, including producers from marginal producing areas with high probability of facing a negative weather shock. This laid the foundation for the establishment of the Fondos; a Government entity which offered farmers the opportunity to access financing by providing banks and financiers with additional security in case of loss in yield (World Bank, 2005).

In Rwanda, Swiss crop insurance programme recently been rolled out to offer low-cost insurance to 20,000 farmers in the southern and western provinces of Rwanda to protect them from financial losses against repeated bad weather destroying their crops. The program, known as Kilimo-Salama, which means 'safe farming', has been running in Kenya since 2010 by the Syngenta Foundation for Sustainable Agriculture, the ministry of Agriculture and Animal Resources, One Acre Fund, SORAS Insurance in Rwanda, and Swiss Re Corporate Solutions. Over 10,000 farmers in Kenya have are said to have received payouts from the programme. In Rwanda, the claims will be paid out based on data from eight weather stations, which have been installed in the Southern and Western provides. The weather stations will record weather changes and release updates on rainfall record. When the data meets the criteria for a claim, it will trigger a payout to One Acre Fund, which will compensate individual farmers or forgive their loans, London (Reuters) 2012-10-12 11:50:44 GMT+00:00

Rodolfo Quiros (2010) argued that the government needs to play a role that is extremely important but limited. It should focus on improving the legal and regulatory framework, extension services, infrastructure development, research, technological innovation, training, collecting and disseminating information, facilitating systems for risk preparedness, and the like. Despite the overwhelming need for insurance on the part of Standard Chartered to support SIF, there is no known multi peril or other forms of insurance competitively available in Uganda as of the period of the study. The absence of insurance further explains why the bank is not aggressively marketing this product as revealed by research findings.

The level of awareness of the stakeholders towards availability of Structured Input Finance.

Client Visits, awareness and training

SIF product in Standard Chartered Bank is designed as wholesale bank product and typically the sales approached is more personalized, emphasis is on relationship management as opposed to mass advertising common with retail/consumer business segments. This perhaps explains why 71% of the respondents agreed that client visits were regularly conducted while relatively low score of 52% agreed that SIF was being advertised. However, since this is a new innovation within the banking sector, to view advertising from a sales perspective alone limits the potential benefits of creating awareness broadly within the industry. The study further revealed that 77% of the respondents agreed that their customers were aware of the product and 84% of the respondents agreed that the customers sometimes provided feedback about this product. What is perhaps more intriguing is the poor correlation between perceived high level of awareness, customer feedback and the inability of staff to explain all the procedure about SIF. The research established that staffs were unable to explain all the procedures and train customers as demonstrated by the low score of 44% and 58% respectively. World Bank (2005) report findings in case study of CRDB Bank in Tanzania observed that the key to CRDB's successful use of SF was due to the in-depth involvement of CRDB staff. The report noted that CRDB's "relationship managers" were trained to know the details of each client's business and they provided expertise to clients on ways of how to efficiently manage their business and the related risks. It was also observed that CRDB staff actively worked with clients to mitigate risks as well as increase profitability with the belief that by improving the way clients do business not only reduce risk but also provide value-added services that will attract new customers to the bank. In other related studies in India, World Bank attributed Basix's (a leading agricultural financial institution in India) success to empowerment of staff to better serve clients.

Building of trust is crucial for the success of structured financing as it leads to evolution of specific skills and knowledge that appear to be lacking among not only the commercial bankers but also the Central Banks. There is urgent need for expertise relevant to value chain analysis and the understanding of the critical elements and relationships of agricultural value chains. This may explain the sluggishness towards selling SIF and the deep rooted inertia towards traditional security and transaction-based lending instead of embedding SIF instruments which collateralize commodities, receivables and other benefits. Related studies by the World Bank in Serbia showed the importance of educating public about SF, it was observed that when the benefits of SF become apparent to the farming community the process of social and cultural change become embedded. The study further reveals reluctance to discuss pricing with customers, suggesting limited risk appetite under SIF. Literature indicates that International commodity bankers have been developing commodity finance structures as a means of opening up profitable new markets and persuading credit analysts that the types of security which have evolved under SF– assignment of export receivables, risk sharing with off takers, substitution of payment

risk for balance sheet risk, etc are adequate replacements for traditional collateral or balance sheet analysis. However, bankers in agro-finance departments have not generally developed structured techniques for use in agriculture and the development of comparable skills in agricultural finance has been neglected. In many Eastern European and Central Asian countries, the lack of finance is most noticeable and most critical at the input stage. This is particularly the case in poorer countries, where financial infrastructure and FDI are poorly developed and where supplier inputs are poorly financed. Without adequate financing at this stage, the value chain can never function.

To assess the suitability of Structured Input Finance in Ugandan Market

The question of suitability is at the core of SF innovation where the ability to link farm production to guaranteed market continuously informs the banks credit process. IFAD (2003) study documented the role of marketing companies in providing small farmer credit in Kenya, Zambia, and Mozambique. The research findings indicate that Standard Chartered's key clients were out growers (mean 1.63, SD=0.72). This comes on the back of opportunities presented by the increasing contracting in Sugarcane growing, Sorghum/Barley and sunflower/soya coupled by the need to partner with manufacturing/marketing companies like Mukwano, Nile Breweries, Kakira Sugar to finance out growers/small holder farmers. The study further observed that the bank had many potential customers (Mean=4.25 and SD=0.78). This is not only consistent with USAID/ AMAP (2005) on the increasing integration in economic activities in the world economy but also the overall opportunity of leveraging on the inter-connectedness to finance agriculture. The research also noted the existence of an enabling regulatory environment, which essentially supports and protects the performance under contract for participants in the value chain.

To come up with strategies to address the challenges of Structured Input Finance

Training: Research findings in table 14 above revealed that there is need to carry out more training staff (Mean = 4.63, SD = .49). The research noted inability of staff to explain all procedures about the product and that customer training was not being done. The training and skills training should be geared towards developing multi-skilled staff, capable of developing Uganda specific credit underwriting standards based on understanding of agricultural value chain, train customers and transform risk management in agriculture. The customer training should not only focus on the ultimate agricultural customers but rather on all parties involved in agricultural value chain (government inclusive). Literature demonstrates the importance of capacity building and training. It was noted that ICICI carried out Capacity building with the assistance of technical and financial support from the United States Agency for International Development (USAID) and the Indian Government, through the Agriculture Commercialization Enterprise (ACE) programme in 1994. Today, ICICI Bank has become the most proficient leader in innovation and provision of agribusiness finance and use of SF to agribusiness and smallholder agriculture.

Standard Chartered as an International Bank with strategic dominance in Asia, Middle East and Africa can further leverage on its experience within the group to migrate best practice, and seek to use its global expertise to influence government. Available literature favours a broader approach to dissemination of SF information and awareness campaign; Establishment of working group of experienced commodity bankers to investigate further the whole area of SF in agriculture and to recommend detailed policy responses, Development of training support programmes for farmers and agribusinesses to illustrate the importance of working in value chains. This could be designed in such a way that involves Standard Chartered arranging with her customers to visit other regions in the world with a view to exposing Ugandan farmers to best practice. Development of training programmes for bank officers, concentrating on value chain analysis, risk analysis and SF techniques. Develop and offer partial or temporary guarantee systems for multilateral agencies to give banks greater confidence in SF lending. Facilitating the development of pilots with banks and agribusinesses in to test and adapt SF instruments and approaches into their operations

Third party guarantees and policy

The study revealed the significance Government and related organizations (Mean = 4.65, SD = .48) in making SIF successful. The key question should be the extent to which government can leverage on SF to increase lending to agriculture in collaboration with commercial banks.

World Bank (2005) noted the significance of Technical Assistance, using case studies in Europe especially the European Bank for Reconstruction and Development (EBRD)-sponsored warehouse receipts program in Kazakhstan. EBRD provided more than 58 million Euros to be lent for pre-harvest and postharvest financing through local partner banks. Similarly the Government of Bulgaria in partnership with the World Bank (under an Agriculture Sector Adjustment Loan [ASAL]) and ACDI/VOCA supported the development of the policy environment and specific legal framework for warehouse receipts World Bank (2005). Further literature suggested that in addition to providing financial capital necessary to start the system, the International Finance Corporation (IFC) assisted the partner banks in drafting their credit procedures and provided Technical Assistance (TA) on the legal framework and training for warehouse inspectors in Europe. Standard Chartered Bank could perhaps seek to leverage on such partnerships in Uganda, especially taking the lead to work hand in

hand with Government (NAADS) and other multi lateral agencies supporting Agricultural finance. In October 2010, Standard Chartered, working in partnership with Zambia's Food Reserve Agency (FRA), was the Mandated Lead Arranger and main financier for a landmark agricultural loan of up to USD140 million. The loan enabled the FRA, a Zambian government agency, to purchase in excess of 470,000 tonnes of maize from around 300,000 small-scale farmers. Despite producing approximately 80 per cent of Zambia's maize crop, small-scale farmers are often marginalized.

Insurance, Weather and Agricultural specialists

Literature suggests multi-peril insurance as integral to the success of SIF; such insurance policies are meant to protect the farmer/bank from loss arising from exogenous factors detrimental to agricultural productivity. In India, BASIX, one of the leading lenders, successfully designed several insurance products in partnership with insurance companies such as group term life insurance product under the "CreditPlus" Scheme, which provided payment equivalent to 150 percent of loan principal to the surviving families of insured borrowers; cattle insurance plan that provided death coverage of livestock with the animals insured for full market value; and a weather index insurance product that triggered automatic payments to farm borrowers in the event of rainfall deficits. It has been observed that weather insurance innovation has enabled BASIX to hedge its portfolio in areas where crop yields (and thus repayment rates) are highly correlated with rainfall. The product was designed and developed in partnership with ICICI Lombard, a leading Indian insurance company, with technical assistance from the Commodity Risk Management Group (CRMG) of the World Bank. The above literature is consistent with the study findings which observed that majority of the respondents strongly recommended the need to identify and partner with insurance service providers (Mean = 4.42, SD = .58).

However, designing insurance policy as seen in the case of BASIX requires accurate and timely information about weather or market values of crops and animals. The research study observed that majority of respondents encouraged reliance on and partnership with other service providers like agronomists and meteorologists (Mean = 4.54, SD = .71). Michael Winn et al (2009) studied the influence of Producer Organizations (PO) or regulated cooperative model in attracting commercial banks to finance agricultural activity. He observed that Banks prefer to work with large exporters to provide SF loans owing to the high costs involved to set up the facility.

Profitability in SIF also depends on the size of the aggregated lending needs, banks require far greater due diligence and more specific legal arrangements than simple balance sheet or collateralized lending and hence their need for large deals. This means that small-scale producers have limited chance of attracting this form of finance, unless small farmers form part of the value chain of a larger agribusiness or regulated cooperative model. This is consistent with the study findings which observed that most respondents favored the need to work closely with farmer groups and lend to corporate as shown by the Mean of 4.51 and SD of .50. Additionally, small farmers lack the capacity to attract or access markets because of small output and lack of knowledge and hence the need for commercial banks to leverage on institutional arrangements, critical in bringing formal risk management to farmer. Whilst insurance is critical and integral to the success of SIF, the usage of formal markets for risk management and insurance is restricted due to underdeveloped financial markets in Uganda. Standard Chartered Uganda Limited will have to contend with the fact that insurance companies in Uganda have no experience in dealing with agricultural risks and hence are reluctant to get involved in the agricultural sector.

Recommendations

In view of the above, the researcher was disposed to make the following recommendations; It was suggested that for the SIF innovation to be implemented successfully, training of staff, customers and other stakeholders within the value chain is paramount.

And as highlighted above, Standard Chartered bank Uganda limited can leverage on lessons from World Bank experience in Eastern Europe, and similar programs ICICI in India, CRDB in Tanzania and on its Group experience in other markets. The research observed the importance of Insurance cover and third party guarantees if SIF related lending is to take off. Standard Chartered Bank Uganda limited's key challenge is therefore the need to find impeccable insurance providers with relevant experience in designing agriculture related policies. The Bank can learn from the experience of Fondo's in Mexico and Basix in India who have run successful partnerships with insurance providers to increase lending to agriculture. In the absence of robust financial market however, as is the case in Uganda, the other alternative to insurance is third party guarantees from Government or Donor agencies.

Standard Chartered Bank Uganda should seek to replicate the experience of Standard Chartered Bank Zambia who worked with the Government of Zambia and Reserve Food Agency to facilitate lending to small farmers who contribute 80% of Zambia's primary agriculture production. The study also highlighted areas of possible partnerships with multi lateral agencies like World Bank and Donor Agencies.

The study also observed the significance of the need for commercial banks to work with lead corporate, Marketers, Manufactures or Producer organizations to improve risk management and lending under SIF. This finding is consistent with the banks focus on larger commercial corporate as the guarantors and primary of

source of information on value chain. Working with lead Corporates is therefore crucial in better understanding the value chain and increases the possibility of risk collaboration.

Whilst private sector expertise and finance should be the primary mover for SIF related lending. The study has highlighted key challenges and clear need for involvement government, donor and other multilateral agencies to support: Legal and institutional reform, government should be involved in a targeted manner to support agricultural financing effort with respect to legal status of warehouse receipts, loan guarantees, and receivable assignments. Leverage and apply USAID/IFC studies elsewhere about use of guarantee programmes to support credit extension to agriculture.

Development of industry wide framework to promote SIF related products involving the relevant stakeholders in insurance, meteorology, agronomy, bank sector and farmers among others. The private sector alone may be able to influence availability of information on weather patterns or research data on the value of agricultural crop or animals, the public sector therefore needs to play an active role.

Areas of further research

The extent of awareness by the relevant policy stakeholders on the opportunities presented by SF generally and SIF in particular towards increasing credit to farmers. For example does Government have a better appreciation of the extent to which partnership with Commercial Banks to provide products such as SIF can have on extension of credit to agriculture in particular and the fight against poverty in general.

Agricultural credit risk management; On the credit risk management side, some of the questions that would be worth understanding is how common is the use of collateral substitute like peer groups, solidarity groups, guarantees by third parties, any substitutes other than the traditional forms of collateral which would be physical assets, both immobile and mobile. The second question worth researching on is whether lenders facilitate access to risk mitigation services for borrowers, do they also arrange for any kind of training, any kind of risk reducing advisory services?

The extent to which reliance on POs or lead cooperates will influence increased credit access to agriculture in general and SIF in particular. For it to make economic sense, banks seek risk mitigation and high ticket deals which makes it difficult for small often isolated out growers to access financing under SIF. The producer organization or cooperatives or even commodity exchange could be useful in pooling together farmers and aggregating the total financing needs with a view to partnering with commercial banks. What model would support reduced transaction and supervisory cost for SIF to be successful in Uganda? It is natural for financial markets, to trade-off between minimizing loan default and supervisory costs, but the nature of agricultural lending makes transaction costs and supervision costs disproportionately high relative to other sectors. The small size of seasonal agricultural credit results in high due diligence costs per loan. The large geographical spread of customers, coupled with poor transportation and communication infrastructure, increase supervisory costs for financial institutions and compliance cost for customers.

References

- Afreximbank. 2008. *Annual report and financial statements for the year December 2007*. African Export Import Bank, Cairo.
- Bardhan, P. 1989. *The Economic Theory of Agrarian Institutions*. OUP, New York.
- Barry, J. P. & Robison, L. J. 2001. Agricultural finance: Credit, credit constraints, and consequences, In B.L. Gardner & G.C. Rausser (eds), *Handbook of agricultural economics: Agricultural production*, Elsevier Science B.V., Amsterdam.
- Bunte, F. 2007. *The Food Economy: Global Issues and Challenges*, OECD, Paris.
- Charitonenko, S. & Bantug-Herrera, A. 2004. *Innovations in Rural and Agricultural Finance in Moldova*. USAID.
- DoingBusiness. 2007. *Doing business in Serbia*. World Bank, Washington D.C.
- Dries, L., Reardon, T. & Swinnen, J. 2004. The Rapid Rise of Supermarkets in Central and Eastern Europe. *Development Policy Review*, vol. 22, no. 5, September 2001: 525-56.
- Dwyer, T. M., Lim, R.K.H. & Murphy, T. 2004. *Advancing the Securitization of Australian Agriculture: Hybrid Equity*. Rural Industries Research and Development Corporation, Kingston, Australia.
- EBRD.2007a. *Transition report*. European Bank for Reconstruction and Development, London.
- EBRD.2007b. Serbia country fact sheet. European Bank for Reconstruction and Development, London. (available at www.ebrd.org/serbia)
- FAO.2008a. *Current World Fertilizer Trends and Outlook to 2011/12*. pp. 24-26. Rome.
- FAO.2007. *Managing Credit Risk in Rural Financial Institutions in Latin America.*, by M. Wenner, S. Navajas, C.Trivelli, & A. Tarazona, Rome.
- FAO.2006. *Development in the European Agrifood Markets: Impact on Producers and Consumers and Perspectives*. Rome.

- FAO.2001. Contract Farming: Partnerships for Growth, by C. Eaton & A. Shepherd, *FAO Agricultural Services Bulletin* No. 145, Rome.
- FAO & EBRD.2006. *Kyrgyzstan and Tajikistan: Expanding finance in rural areas*, by M. Marx and F. Hollinger, Rome.
- Gow, H., & Swinnen, J. 2001. Foreign direct investment and vertical contracting in the agro-food sector of transition countries, In S. A. Rausser, G. Zilberman (eds.) *Agricultural Globalization, Trade and the Environment*.
- Gow, H., & Swinnen, J. 1999. Agricultural Credit Problems and Policies during the Transition to a Market Economy in Central and Eastern Europe. *Food Policy*, No. 24.
- Gow, H. & Swinnen, J. 1998. *The impact of FDI on CEEC agricultural growth: Case studies*. Policy Research Group Working Paper, Department of Agricultural Economics, Katholieke Universiteit Leuven, Belgium.
- Gow, H., Streeter, D. & Swinnen, J. 2000. How private contract enforcement mechanisms can succeed where public institutions fail: the case of Juhosucor A.S., *Agricultural Economics*,23 (3): 253-265.76
References
- Guo, H., Hongdong, J. W. R. & Zhu, J. 2005. *Contract Farming in China: Supply Chain or Ball and Chain?* Zhejiang University, China.
- IFC. 2005. *Investing in progress, 2005 annual report*. International Finance Corporation, Washington D.C.
- IMF. 2006. *Annual Report of the Executive Board for the Financial Year Ended April 30, 2006*. International Monetary Fund, Washington D.C.
- Key, N. & Runsten, D.1999. Contract Farming and Rural Development in Latin America: the Organization of Agroprocessing Firms and the Scale of Outgrower Production. *World Development*, 27(2): pp. 381-401.
- Macours, K. & Swinnen, J.F.M. 2008. Rural-Urban Poverty Differences in Transition Countries. *World Development* Vol. 36, No. 11, pp. 2170–2187.
- Miller, C. & da Silva, C. 2007. Value Chain Financing in Agriculture. *Enterprise Development and Microfinance* Vol. 13, Nos. 2 & 3, Practical Action Publishing, Rugby, United Kingdom.
- Minot, N. 1986. Contract Farming and its Effect on Small Farmers in Less Developed Countries. *Working Paper* No. 31, International Development Papers, Michigan State University, Michigan, United States of America.
- NBS. 2007. *Statistical Bulletin, January-February 2007*. National Bank of Serbia, Belgrade.
- Pearce, D. 2003. *Rural Finance Innovation Case Study Buyer and Supplier Credit to Farmers: Do Donors have a Role to Play?* CGAP.
- Prowse, M. 2007. *Making Contract Farming Work with Co-operatives*. ODI, London.
- Reardon, T., Vrabec, G., Karakas, D. & Fritsch, C. 2003. *The rapid rise of supermarkets in Croatia: Implications for farm sector development and agribusiness competitiveness programs*. USAID.
- Roduner, D. 2007. *Donor Interventions in Value Chain Developments*. Swiss Agency for Development and Cooperation (SDC), Berne, Switzerland.
- Rojas, E. A. *Livestock Securitization in Colombia*. (available at <http://www.incae.ac.cr/EN/clacds/nuestros-proyectos/archivo-proyectos/proyectos-de-competitividad-clima-de-negocios/pdfs/Titularizacion-ganadera-en-Colombia-english.pdf>)
- Rosenthal, J. A. & Ocampo, J. M. 1989. *Securitization of credit: Inside the new technology of finance*. Wiley.
- Rutten, L. & Mahajan, N. 2005. *Potential Uses of Structured Finance Techniques for Renewable Energy Projects in Developing Countries*. UNCTAD.
- Rutten, L. 2002. *Farmers and Farmers Associations in Developing Countries and their Use of Modern Financial Instruments*. UNCTAD.
- Rutten, L. 2001. *Potential Applications of Structured Commodity Financing Techniques for Banks in Developing Countries*. UNCTAD.
- SIEPA.2006. *Facts about Serbia*. Serbia Investment and Export Promotion Agency, Belgrade (available at http://www.siepa.sr.gov.yu/attach/Facts_about_serbia.pdf)
- Singh, S. 2002. Contracting out Solutions: Political Economy of Contract Farming in the Indian Punjab Institute of Rural Management. *World Development*, 30 (9): pp. 1621–1638.
- Swinnen, J., Buckwell, A. & Mathijs, E. (eds).1997. *Agricultural Privatisation, Land Reform and Farm Restructuring in Central and Eastern Europe*. Aldershot, Ashgate, UK.
- Trzeciak-Duval, A. 2007. *Agriculture Finance and Credit Infrastructure – Conditions, Policies and Channels*. OECD, Paris.
- UNCTAD.2005. *Potential Uses of Structured Finance Techniques for Renewable Energy Projects in Developing Countries*. UNCTAD Secretariat. *The use of Structured Finance instruments in agriculture in Eastern Europe and Central Asia* 77

- UNCTAD.2002. *Farmers and farmers associations in developing countries and their use of modern financial instruments*. UNCTAD Secretariat.
- World Bank.2008. *World Development Report 2008: Agriculture for Development*, Washington D.C.
- World Bank. 2007. *Leasing: An Underutilized Tool in Rural Finance*, by A. Nair, R. Kloeppinger-Todd, & A. Mulder, Washington D.C.
- World Bank. 2003. *Ten Years of Transition in the Agricultural Sector, Analysis and Lessons from Eastern Europe and the Former Soviet Union*, by C. Csaski, & A. Nusifora, Washington D.C.
- Zivkov, G. 2005. *Rural Finance: development of rural finance*. Presentation at the Novi Sad fair, May 2005, Ministry of Agriculture, Forestry and Water Management. (available at: <http://www.minpolj.gov.rs>).
- FAO Contract Farming Resource Centre www.fao.org/ag/ags/contract-farming
- Castle, E, M. Becker, and A. Nelson (1987). *“Farm Business Management: The Decision-Making Process.”* Macmillan Publishing Company, New York.
- Coulter, J., A. Goodland, A. Tallontire, and R. Stringfellow (1999). *“Marrying Farmer Cooperation and Contract Farming for Service Provision in A Liberalizing Sub-Saharan Africa.”* London: Overseas Development Institute. *Natural Resources Perspectives*, No. 48. <http://www.odi.org.uk/nrp/48.html>
- Baumann, P. (2000). *“Equity and Efficiency in Contract Farming Schemes: The Experience of Agricultural Tree Crops.”* London: Overseas Development Institute, Working Paper No. 139. www.odi.org.uk/publications/working_papers/wp139.pdf
- Eaton, C. and A. W. Shepherd (2001). *“Contract Farming: Partnership for Growth.”* Rome: Food and Agricultural Organization. *Agricultural Services Bulletin*, No. 145.
- Elyanu, J., J. Mugisha, T. Hyuha, and B. Bashaasha (2002). *“Assessment of Factors Affecting the Incidence and Rate of Adoption of Improved Sorghum Varieties in Eastern Uganda.”* Forum on Agricultural Resource Husbandry: Working Document No. 5.
- Glover, D. J. (1987). *“Increasing the Benefits to Smallholders from Contract Farming: Problems for Farmers’ Organizations and Policy Makers.”* *World Development*, Volume 15, Issue 4, April, pp. 441-448.
- Glover, D. J. (1983). *“Contract Farming and Smallholder Outgrower Schemes in Less Developed Countries.”* *World Development*, Volume 12, pp. 1143-1157.
- Key, N. and D. Runsten (1999). *“Contract Farming, Smallholders, and Rural Development in Latin America: The Organization of Agroprocessing Firms and the Scale of Outgrower Production.”* *World Development*, Volume 27, Issue 2, February, pp. 381-401.
- Masakure, O. and S. Henson (2005). *“Why do Small-scale Producers Choose to Produce under Contract? Lessons from Non-traditional Vegetable Exports from Zimbabwe.”* *World Development*, Volume 33, Issue 10, October, pp. 1721-1733.25
- Mugerwa, W. K. (2005). *“Emerging Role of Farmer Groups in Contract Farming in Uganda.”* Working Paper, Addis Ababa, International Food Policy Research Institute.
- Fries, Robert and Banu Akin, *“Value Chains and Their Significance for Addressing the Rural Finance Challenge”*, MicroREPORT No. 73, USAID, AMAP, Washington DC, December 2004. www.microlinks.org.
- Gonzalez –Vega, Claudio, Geoffrey Chalmers, Rodolfo Quiros, and Jorge Rodriguez- Meza, Hortifruti in Central America: A Case Study about the *“Influence of Supermarkets on the Development and Evolution of Creditworthiness and Small and Medium Agricultural Produces,”* MicroREPORT No.57, USAID, AMAP, Washington DC, April 2006. www.microlinks.org.
- Haggblade, Steven, *“Subsector Supply Chains: Operational Diagnostics for a Complex Rural Economy,”* in *Transforming the Rural Nonfarm Economy: Opportunities and Threats in the Developing World*, edited by Steven Haggblade, Peter Hazell and Thomas Reardon, in press, Johns Hopkins University Press, Baltimore, 2007. IFAD, *“Agricultural Marketing Companies as Sources of Smallholder Credit in Eastern and Southern Africa,”* Rome, December 2003.
- Kaplinsky, Raphael and Mike Morris, *“A Handbook for Value Chain Research,”* Prepared for IDRC, 2001. <http://asiandrivers.open.ac.uk/Resources.html>.
- Meyer, Richard L., Catherine Johnston, and Alexis Curtis, *“Agricultural Value Chain Finance: Sugar, Maize and Sunflower in Uganda,”* Draft paper submitted to USAID, September, 2006.
- Nagarajan, Geetha and Richard L. Meyer. 2005. *“Rural Finance: Recent Advances and Emerging Lessons, debates, and Opportunities.”* Reformatted version of Working Paper No. (AEDE-WP-0041-05), Department of Agricultural, Environmental, and Development Economics, The Ohio State University, Columbus, Ohio, USA.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

