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# Rice inventory credit in Madagascar : diversity of rural household strategies around an hybrid financial and marketing service.

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## Résumé

Le réseau des Caisses d'épargne et de crédit agricole mutuels de Madagascar (CECAM) propose à ses sociétaires un produit innovant de crédit stockage pour le riz depuis 1993. La communication part du constat que le crédit stockage est un produit hybride, qui combine des flux et des stocks en numéraire et en nature, qui présente à la fois des caractéristiques de crédit et d'épargne, et qui s'articule étroitement avec les dynamiques du marché du riz local. Elle s'intéresse aux conditions d'accès et d'utilisation du crédit stockage par différentes catégories de ménages sociétaires, et à la façon dont ce produit s'insère dans les stratégies de ces ménages. La communication repose sur une analyse de données quantitatives et qualitatives collectées par les auteurs à l'occasion d'une étude d'impact du réseau menée entre 2003 et 2007. Les données suggèrent que le crédit stockage Cecam répond de manière globalement satisfaisante aux différents besoins des ménages pauvres et non pauvres : il leur permet d'abaisser le seuil d'accès au crédit, de mieux valoriser leur production de riz (que ce soit pour la vente ou l'autoconsommation), et de poursuivre différents types de stratégies (plutôt orientées vers la sécurisation alimentaire pour les ménages pauvres, plutôt associées à une logique entrepreneuriale et de diversification pour les ménages non pauvres).

**Mots-clés** : microfinance rurale, crédit stockage, stratégies des ménages ruraux, Madagascar

## Abstract

The Malagasy rural finance network CECAM has been offering an innovative individual rice inventory credit to its members since 1993. Starting from the acknowledgement that the inventory credit is a hybrid product, which involves a mix of in kind and in cash flows and stocks, a mix of credit and savings features, and linkages with the local rice market, the papers sets out to inquire how it is accessed, used, and inserted in the strategies of different wealth categories of Cecam members. The paper is based on an analysis of quantitative and qualitative data that were collected in several phases during a 4 year impact study conducted by the authors from 2003 to 2007. Evidence suggests that the Cecam inventory credit is globally well suited to the differentiated needs of poor as well as nonpoor households, because it lowers the access thresholds, it enhances the value of their rice production (be it for consumption or sale) and it allows them to pursue different kinds of strategies (more food security oriented for the poor, more entrepreneurial and diversification oriented for the non poor).

**Keywords** : rural microfinance, inventory credit, rural household strategies, Madagascar

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<sup>1</sup> The data presented in this paper were collected during an impact study contract funded by the European Development Fund in Madagascar and are the property of the Government of Madagascar. The analyses are drawn from partial results of the study and are the sole responsibility of the authors.

# 1. Introduction

Rural finance and even more so agricultural finance still raise considerable challenges to policymakers and practitioners alike (Nagarajan and Meyer 2005, CGAP 2005). After the dismantling of public agricultural development banks in many developing countries, outreach levels have remained quite low. Microfinance institutions are faced with many difficulties expanding into the rural areas, one of which is the inadequacy of the traditional microfinance products, tailored for urban, commerce oriented clients, to the specific features of the demand of rural and agricultural households. In this gloomy panorama, the case of the “Caisses d’épargne et de crédit agricole mutuels de Madagascar” (CECAM) is particularly outstanding and offers a lot to learn from.

The CECAM have been providing Malagasy rural households with a range of innovative financial products since 1993. Among those is a rice inventory credit product, called “Grenier commun villageois” (GCV), which in 2006 accounted for a third of the CECAM credit portfolio (Table 1). This individual credit product is fully collateralized by the debtor’s rice stock, which is held jointly by the local CECAM branch and the GCV users for the duration of the loan – six months on average. The loan amount is computed by multiplying the quantity of rice stored by a percentage factor (usually 75%) of the local rice price at the time of the harvest (Box 1). There is no specified purpose for the loan, although productive off-season activities (agricultural or non agricultural) are encouraged. Loan instalment and repayment take place respectively around the harvest period (june-july) and at the end of the year when local rice prices usually start to rise due to the lean season.

The Cecam GCV credit thus combines two objectives. Aside from the short term credit, it allows the producer to store its harvest (or part of it) until the lean season, when local market prices are higher. After reimbursing his credit, the producer can either 1) self-consume his stock, which allows him not to buy food on the market at a high price and thus to economize over the year on its food expenses, or 2) sell his stock, thereby realizing a monetary gain through the price differential between harvest time and lean time.

According to the Cecam leaders and managers, the GCV is intended to be particularly beneficial for poor households. Since the only collateral required is rice stock, and the minimum quantity required to file for a loan is set at a low level of 75 kg, it is easily accessible even to small-scale rice producers that cannot provide the traditional collateral required for the other loan products offered by the network (not to mention the formal banking system). Also, by allowing households not to sell their rice at harvest time when they may be in need for cash but the local price is low, and by postponing their use of the rice stock, thus allowing them to lower their purchases of rice for family consumption when the price is high, the GCV is expected to have some positive impact in terms of food security. However, because of its dual nature of financial and marketing service, the GCV can also be an attractive product for non poor households.

**Table 1 Cecam loan portfolio – main products 2006**

|                   | <b>Number of loan files</b> | <b>Amount</b> | <b>Average loan amount (€)</b> | <b>Average length (months)</b> |
|-------------------|-----------------------------|---------------|--------------------------------|--------------------------------|
| <b>Productive</b> | 52%                         | 40%           | 180                            | 8                              |
| <b>GCV</b>        | 33%                         | 34%           | 240                            | 6                              |
| <b>Leasing</b>    | 7%                          | 16%           | 560                            | 20                             |
| <b>Social</b>     | 5%                          | 1%            | 30                             | 3                              |
| <b>Commercial</b> | 2%                          | 6%            | 600                            | Na                             |
| <b>TOTAL</b>      | 35 832                      | 8.3 million € | 230                            | -                              |

Source : Cecam MIS.

**Box 1 : The CECAM inventory credit GCV**

**Interest rate** : 3% per month, minimum 5 months (even if ahead reimbursement)

**Ceilings for approval procedure:**

At the local branch : 5 tons of paddy

At the regional level : 20 millions Ariary (8000 €)

At the national level : no specified ceiling

**Length** : 5 to 10 months for paddy

**Collateral** : individual stock of rice

**Computing factor for the calculation of loan amount** : 65% to 75% of the current local price for paddy

**Varying shares :**

5% of the loan amount for amounts up 2 millions Ariary (800 €) and 4% on the remaining amount

**Stock requirements :**

Minimum number of borrowers per warehouse facility : 2. The storage is collective but each stock and credit is individually managed. For big storers (usually above 5T), individual storage can be tolerated.

Minimum volume of individual stock of paddy : 75 kg

**Warehouse requirements :**

The building can be owned by one of the members or rented from someone else. In some regions, Cecam has had some collective warehouses build with financial support from the EU.

Solid materials for walls and roof

One entry/exit

2 locks (1 is kept by the Cecam credit officer, 1 by the representative of the storers)

**Instalments** : 1 or more instalments upon decision of member (allows for staggered harvest and storage, or storage of a combination of produced and purchased rice)

**Payments** : 1 or more payments upon decision of member. The payment must be made before the rice stock is given back (totally or partially depending on the amount repaid).

**Monitoring :**

Regular controls of the warehouse situation by Cecam credit officers

Opening of the warehouse and delivery of rice stocks back to their owners are made under the supervision of credit officers and warehouse borrowers representative

The Cecam GCV stands out from the classical inventory credit in the sense that there is no third party involved in the storage. As a financial institution, Cecam also takes care of the storage monitoring, and the responsibility for the maintenance of the stock in good conditions falls upon the group of member storers.

Source : CECAM

The literature on inventory credit is still quite scarce. The main focus is on inventory credit as a way to regulate agricultural markets in a context of liberalization, with a discussion on the institutional conditions that are required for it to perform this function adequately. The main actors considered as involved with the inventory credit are producers organisations and individual agricultural traders rather than producers themselves (even though they are expected to indirectly benefit from the market regulation) (Coulter and Shepherd 2001, Coulter and Onumah 2002). Somewhat surprisingly, in its recent review of models for agricultural finance, the CGAP (2005) makes no mention of this kind of financial product. Onumah (2003) does focus on the implications in terms of rural finance, but mostly from the perspective of the financial institution. One advantage of the inventory credit is the lower level of default risk (as Table 2 also illustrates in the case of CECAM). In this paper, we take on a different approach. Since the GCV offered by Cecam is intended for individual members, who engage in rice production (and sometimes in small-scale rice marketing too), we focus on the perspective of these individual users and their households.

**Table 2 : prevalence of repayment delays by loan products**

|                   | <b>Rate of delay</b> | <b>Total N</b> |
|-------------------|----------------------|----------------|
| <b>GCV</b>        | 7%                   | 1020           |
| <b>Social</b>     | 15%                  | 422            |
| <b>Productive</b> | 18%                  | 1263           |
| <b>Leasing</b>    | 30%                  | 138            |
| <b>Total</b>      | 15%                  | 2843           |

Source : Cecam impact study panel survey and Cecam MIS

The paper is based on an analysis of quantitative and qualitative data that were collected in several phases during a 4 year impact study conducted by the authors from 2003 to 2007. Starting from the acknowledgement that the GCV is a hybrid product, which involves a mix of in kind and in cash flows and stocks, a mix of credit and savings features, and linkages with the local rice market, it sets out to inquire how it is accessed, used, and inserted in the strategies of different wealth categories of Cecam members.

The paper is structured as follows. Section 2 presents the methodology. Section 3 addresses the conditions of access of the GCV, and the product assessment by the members, across three wealth categories. Section 4 deals with price differentials and food security issues. Section 5 provides qualitative insights into the diversity of rationales and processes of GCV management. Section 6 concludes with operational implications.

## **2. Methodology**

The data presented in this paper are drawn from a broader impact study of the Cecam network that was conducted by the authors between 2003 and 2007. The study relied on a combination of quantitative and qualitative approaches, following some of the current trends in microfinance impact studies (Dunn and Arbuckle 2001, Hulme 2000, Sebstad and Cohen 2000, Copestake et al 2005) and more generally in development studies (Kanbur and Shaffer 2007)<sup>2</sup>. The central unit of analysis was the rural household (rather than the farm or the rural microenterprise), to account for the fact that productive strategies and trajectories take place within a portfolio of several agricultural and nonagricultural activities, and that they are nonseparable from broader livelihood strategies which are also related to the position of the household in the lifecycle.

A three-year panel survey was set up with a stratified sample of 505 households (including Cecam members and non members). The first round was conducted in 2003 (N=505), followed by two subsequent rounds in 2006 (N=412) and 2007 (N=390)<sup>3</sup>. The questionnaire included several modules on household composition, income-generating activities, assets, financial practices (credit and savings, formal and informal), and a specific module for Cecam members (credit trajectories, relationship with Cecam, assessment of procedures and products, etc.). A multivariate factor analysis was applied to the 2003 data to classify the households into three wealth categories, which will be used all along the paper (basic descriptive statistics are provided in Table 3). The quantitative data provides information on the credit trajectories of 332 Cecam members, and specific information on 229 GCV credits that were taken by these members during the 2003-2007 period.

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<sup>2</sup> For a discussion on the methodological aspects of the study, see Bouquet, Wampfler and Ralison (2009).

<sup>3</sup> The differences in sample size are due to attrition.

**Table 3 : Household wealth categories – panel survey**

|                                                   | <b>Total</b> | <b>Non poor</b> | <b>Medium</b> | <b>Poor</b> |
|---------------------------------------------------|--------------|-----------------|---------------|-------------|
| N obs.                                            | 505          | 124             | 173           | 208         |
| % total surveyed                                  | 100%         | 25%             | 34%           | 41%         |
| % Cecam members                                   | 100%         | 30%             | 41%           | 30%         |
| % non Cecam members                               | 100%         | 15%             | 22%           | 63%         |
| Average monetary income (euros)                   | 440          | 1160            | 400           | 120         |
| Average assets (equipment + livestock) (euros)    | 480          | 1120            | 400           | 200         |
| % households with exclusively agricultural income | 39%          | 19%             | 39%           | 51%         |

Source : Cecam impact study panel survey

The qualitative information used in this paper is taken from two rounds of in-depth interviews. The first one was conducted in 2003 on a subsample of 100 households (members and non members) from the panel survey. The interviews addressed the economic and credit trajectories of the households, and their underlying strategies and rationales. The second round was conducted in 2007 on a sample of 41 member households who had experienced the GCV. In-depth interviews focused specifically on the uptake and the management of the GCV within their credit trajectories with the CECAM. The 41 households were also classified into three wealth categories, based on a qualitative assessment that included housing conditions as well as the level and composition of assets and activities portfolio (10 households were classified as poor, 20 as medium and 11 as non poor). Detailed information was obtained on 73 GCV contracts taken by these 41 households mostly in 2007 and some in the previous years. The duration of these interviews ranged from 2 to 3 hours. While the quantitative panel survey was applied by surveyors (under close supervision by one of the authors of the study), all the qualitative interviews were conducted directly by the authors themselves, one of which is Malagasy and has an extensive experience of fieldwork in Malagasy rural settings. This allows for a fair level of confidence in the global relevance and reliability of the collected data.

### **3. The GCV is accessed and appreciated by all categories of households**

#### ***Access and use***

The GCV appears as a pillar of the credit trajectories of most Cecam members. It is present in 80% of members credit trajectories. In 93% of the cases, it is combined with productive credit, which is generally used for rice cultivation. The GCV is complementary to the productive credit in the sense that it allows the member not to sell all his production at harvest time (at a low price) in order to repay the productive loan which has arrived at maturity. Indeed, Table 4 shows that in 22% of the cases, part of the GCV loan amount was used to repay another Cecam credit (usually a productive credit). As expected, the most frequent declared use of the GCV is linked to off-season productive activity, either agricultural or non agricultural. Note that almost a quarter of the GCV users also declared having used part of the loan to buy rice (more on this in section 4).

**Table 4 : use of GCV 2003-2007**

|                                              | <b>N</b> | <b>%</b> |
|----------------------------------------------|----------|----------|
| <b>Productive activity</b>                   |          |          |
| Agricultural                                 | 71       | 31%      |
| Non agricultural                             | 95       | 41%      |
| <b>Productive investment</b>                 | 17       | 7%       |
| <b>Rice purchase</b>                         | 52       | 23%      |
| <b>Reimbursement of another Cecam credit</b> | 50       | 22%      |
| <b>Other</b>                                 | 23       | 10%      |
| <b>Total</b>                                 | 308      | 134%     |
| <b>N GCV</b>                                 | 229      | 100%     |

Source : Cecam impact study panel survey. Total above 100% because multiple answers allowed.

Table 5 displays the distribution of credit uptakes by the Cecam members since they joined the institution, according to their wealth categories. It shows that the access and use of the GCV is independent of the level of wealth (the KHI2 test for the GCV row is not significant). This suggests that although the GCV was intended to lower the credit access threshold for poor households with little material collateral, it is also attractive to non poor households, although it might be for different reasons.

**Table 5 : distribution of credit uptakes by members since they joined Cecam, by wealth categories**

|                      | Non poor | Medium | Poor | Total | N    |
|----------------------|----------|--------|------|-------|------|
| <b>Productive</b>    | 26%      | 45%    | 29%  | 100%  | 1537 |
| <b>GCV</b>           | 29%      | 43%    | 28%  | 100%  | 1096 |
| <b>leasing</b>       | 37%      | 40%    | 23%  | 100%  | 196  |
| <b>Social</b>        | 23%      | 46%    | 30%  | 100%  | 498  |
| <b>Total credits</b> | 27%      | 44%    | 29%  | 100%  | 3327 |
| <b>Total members</b> | 30%      | 41%    | 30%  | 100%  | 332  |

Source : Cecam impact study panel survey and Cecam MIS. Khi2 test non significant for the GCV

While access to the GCV is evenly distributed across all wealth categories, the volumes stored (and thus the loan amounts) show a clear differentiation (Table 6). The average volume stored by non poor households is significantly higher than for the other two groups (2,6 Tons against 1,8 and 1,5 respectively). The same holds true for the average volume produced per household per year. If we compare the mean volumes produced and stored across categories, it appears that poorer households are left with significantly less rice stock at home (for either sale or consumption) than non poor household (0,9 T versus 1,9T for the medium and 3T for the non poor). Although no straightforward conclusion can be drawn from this result alone, there might be some implications regarding the households food security (and more generally, economic resilience) during the storage period (see section 4 and 5).

**Table 6 : Rice production and volumes stored in the GCV, by wealth categories**

|                            | Non poor | Medium | Poor | Total |
|----------------------------|----------|--------|------|-------|
| <b>Rice storage (T)</b>    |          |        |      |       |
| N                          | 51       | 93     | 72   | 216   |
| Average                    | 2,6      | 1,8    | 1,5  | 1,9   |
| Std deviation              | 2,2      | 1,5    | 1,5  | 1,7   |
| Median                     | 1,7      | 1,2    | 1,0  | 1,2   |
| <b>Rice production (T)</b> |          |        |      |       |
| N                          | 50       | 95     | 73   | 218   |
| Average                    | 5,6      | 3,7    | 2,4  | 3,7   |
| Std deviation              | 7,1      | 2,5    | 1,3  | 4,0   |
| Median                     | 3,4      | 3,1    | 2,2  | 2,9   |

Source : Cecam impact study panel survey

## Assessment

The GCV appears as one of the best rated Cecam credit products: 63% of the GCV users declared that they are totally satisfied with the product (Table 7)<sup>4</sup>. In the quantitative survey, interviewees were also asked to give a score, on a 10 point scale, for each product they had experienced in their credit trajectories. For the GCV, 10% of the scores were under the average 5, 11% were set at the average, and 79% were above the average.

<sup>4</sup> For a discussion on the other product assessments, see Bouquet, Wampfler, Ralison (2007, 2009).

**Table 7 : Satisfaction rate for the main credit products by credit users 2003-2007**

|                          | <b>productive</b> | <b>gcv</b> | <b>social</b> | <b>leasing</b> | <b>Total</b> |
|--------------------------|-------------------|------------|---------------|----------------|--------------|
| <b>Totally satisfied</b> | 38%               | 63%        | 44%           | 62%            | 49%          |
| <b>N</b>                 | 310               | 229        | 57            | 102            | 719          |

Source : Cecam impact study panel survey

Quantitative data (Table 8) and qualitative discussions provide some additional insights into the issues that are relevant for GCV users. This in turn can inform the rationales and strategies behind the GCV uptake.

Since the assessment criteria presented in Table 8 were those formulated by the respondents themselves for all the Cecam loan products<sup>5</sup>, the lines that get a low percentage of criticism can be interpreted as a sort of appraisal “by default”. The absence of material collateral (aside from the stock of rice), the easiness of the filing procedure, the flexibility in terms of amount, instalment and repayment schedules are highly appreciated. Interestingly, the easiness of access to the GCV was also valued by nonpoor household, although for different reasons than the poor, as the qualitative data showed.

For the poor, what mattered was the fact that they did not have to struggle to provide collateral other than their own rice stock. For the wealthiest of the nonpoor, who are not usually not constrained in terms of the material collateral that they can provide, what mattered was the fact that with the GCV they could very quickly access amounts much higher than with the productive credit. According to the CECAM procedures, a request for a productive credit above 800 euros has to be transmitted by the local branch to the regional office before approval, which lengthens the delays. Also, filing for a productive credit requires that official proofs are provided for collateral ownership, which entails sometimes cumbersome administrative procedures (for example, the property of an ox has to be certified with a document stamped by the municipality). With the GCV, the ceiling is set up to 8000 euros, and the disbursement takes place immediately after storage.

Qualitative data confirm the high rate of approval of the GCV among the users, and give some additional insights. Particularly relevant is the level of trust that the borrowers have in the storage system. Stakes are very high since it is their rice stock and it cannot be removed for the duration of the loan. Several people compared with other inventory credit experiences that they had heard about or experienced themselves (run by NGOs, other MFIs, the church etc.) : stories of stock losses, thefts or more simply lack of rigour in the warehouse management abounded. By contrast, the Cecam was acknowledged as a very serious and reliable structure to engage with.

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<sup>5</sup> The questionnaire featured an open question and the coding was done afterwards.



**Table 8 : Main issues mentioned with regards to the GCV by users non totally satisfied, 2003-2007**

|                                                             |             |
|-------------------------------------------------------------|-------------|
| <b>Issues linked with access to credit</b>                  |             |
| Collateral too high                                         | 2%          |
| Varying share too high                                      | 20%         |
| Procedure too cumbersome                                    | 2%          |
| Fees too high                                               | 2%          |
| Amount lower than requested                                 | 0%          |
| Computing factor too low                                    | 14%         |
| <b>Issues linked with credit leverage and reimbursement</b> |             |
| Delay in credit instalment                                  | 20%         |
| Interest rate too high                                      | 51%         |
| Reimbursement procedure inappropriate                       | 6%          |
| Term too short                                              | 2%          |
| Other                                                       | 16%         |
| <b>Total</b>                                                | <b>138%</b> |
| <b>N answers</b>                                            | <b>117</b>  |
| <b>N respondents<sup>a</sup></b>                            | <b>85</b>   |

<sup>a</sup>: number of answers higher than number of respondents due to multiple answers allowed.

Source : Cecam impact study panel survey.

If we turn to criticisms, the most salient complaint was about the interest rate (cited by 51% of respondents). Although it is a recurrent criticism in microfinance users assessments, and somehow it is “part of the bargaining game” between the clients and their institutions, it can provide information in terms of comparison with the local competing institutions. More specifically, some members expressed that some institutions are offering a lower interest (examples include 2% and 2,5%, compared to 3% for the Cecam). They also referred to the fact that a minimum 5 month interest are due, irrespective of whether the repayment takes place ahead of time.

The criticism about delays in credit instalment (cited by 20% of respondents) is mostly linked with the fact that the Cecam network went through several years of refinancing shortage due to a fast expansion phase. Although this problem was eventually solved after 2006 because the CECAM was able to strike a deal at the national level with the formal banking system, it left bad memories among the members who had been hit, as the following example illustrates:

*During the qualitative interviews, one member told us that in 1999 the credit instalment was delayed two months whereas his rice was already stored and could not be unstored. The member had planned to use the money to trade rice and to buy a piece of land. Because of the delay, he had to buy the rice at a higher price and he lost the opportunity to buy the plot because someone else was able to pay cash and got the deal. After that, he stopped doing GCV during 6 years because he did not trust the Cecam branch anymore. He went back afterwards when he saw that the problems seemed to have been solved. By the time of the interview, he had not run into this kind of problems anymore.*

Anecdotal evidence also suggests that in some branches there is a risk of crowding out of small rice storers for the benefit of large storers who can be producers as well as traders. This has to do also with the incentive system for credit officers, which is mostly expressed in terms of loan volume rather than in loan numbers. For a credit officer, it is therefore rational to first serve the large rice storers, in order to reach their operational objectives, and then the smaller ones. This can entail problematic delays all the more so if there is some shortage of lending funds.

For 14% of the respondents, the computing factor was deemed too low, which expresses a restriction on the loan amount compared to what they would have desired. Qualitative interviews allowed us to go a little deeper into how members perceive and understand the computing factor system. Although some consider that it definitely should be closer to the actual market price at the time of harvest, most people (and particularly among the poor and the medium wealth categories) understand it as a

tradeoff between access to a certain loan amount and a risk-reducing device with regards to possible and unexpectable failures in price differentials, which would put some pressure on their capacity to take benefit out of the loan.

*“If the rice prices do not evolve as usual, like in 2005 for example, then it is better to have a lower quantum because then it will be easier to repay the loan”.*

During the qualitative interviews, one woman even expressed that she would like the quantum to be lower, so that she would not take so much risk with a credit that she is not sure to be able to repay easily at the beginning of the lean season<sup>6</sup> :

*“with a lower quantum I get a lower credit which will be easier to repay”*

This is an extreme case, but illustrative of one of the rationales behind the GCV, which is based more on the savings than on the credit features of this financial product (more on this in section 5).

Finally, the qualitative interviews allowed us to identify a major restriction for GCV expansion that had gone unnoticed with the quantitative questionnaire. Expansion of individual GCV volumes are often constrained by the lack of warehouse facilities that comply with the requirement set up by the Cecam (17 cases out of 41, that is 41%). This is particularly the case in one of the regions under study, where traditional buildings are made of rush, not of brick as it is generally the case in the central highlands. In two cases, people told us that they had built a brick house for their family, and that they had moved back into their old rush house in order to leave the brick building for the rice storage. This indirect access constraint to the GCV is more likely to affect the medium households that are on an rising economic trajectory and who would like to increase the volumes stored (10 cases were reported, which represent half of the sample medium households). For poor households, the quantity that they are able to set aside is generally the prime limiting factor (no poor household declared that they were warehouse constrained). On the other hand, nonpoor households that are warehouse constrained have more investment capacity and can make plans to build additional storage facilities.

## **4. Price differentials and food security**

### ***Price differentials are sizeable and evenly distributed across wealth categories***

Table 9 displays descriptive statistics for the price differences between the time of storage and unstorage. These differences were recorded for 188 GCV between 2003 and 2007. The second section of the table, where the price difference is expressed in percentage of the initial price, shows an average difference of 44%. If we consider an average length of 6 months, this simple result illustrates quite an impressive benefit from the marketing side alone. This makes the GCV an outstanding product from a savings perspective.

On the equity ground, Table 9 indicates that these benefits accrue evenly to all categories of households : the means and percentile distributions do not exhibit distinctive patterns.

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<sup>6</sup> Apparently this claim was expressed in a number of quantitative questionnaires as well. Unfortunately, it was not singled out as a specific criticism during the coding phase and was integrated into the aggregated “other” category. This anecdote illustrates (although too late in this case) the importance of iterative back and forth moves between the quantitative and the qualitative in order to foster the relevance of the quantitative data.

**Table 9 : Price difference in GCV**

|                                               | N GCV | Average | Standard deviation | Min  | 25th centile | 50th centile | 75th centile | Max  |
|-----------------------------------------------|-------|---------|--------------------|------|--------------|--------------|--------------|------|
| <b>Price difference in €/T</b>                |       |         |                    |      |              |              |              |      |
| Non poor                                      | 42    | 68,8    | 46,8               | 0    | 40           | 62           | 95,6         | 236  |
| Medium                                        | 79    | 60      | 37,2               | -70  | 40           | 64           | 80           | 140  |
| Poor                                          | 67    | 68      | 78,4               | -28  | 40           | 68           | 92           | 160  |
| Total                                         | 188   | 65,2    | 40                 | -70  | 40           | 64           | 92           | 236  |
| <b>Price difference in % of initial price</b> |       |         |                    |      |              |              |              |      |
| Non poor                                      | 42    | 45%     | 33%                | 0%   | 24%          | 39%          | 63%          | 169% |
| Medium                                        | 79    | 40%     | 25%                | -20% | 20%          | 43%          | 56%          | 100% |
| Poor                                          | 67    | 49%     | 32%                | -10% | 25%          | 49%          | 67%          | 140% |
| Total                                         | 188   | 44%     | 29%                | -20% | 25%          | 43%          | 60%          | 169% |

Source : Cecam impact study panel survey

Obviously, local prices are not insulated from external shocks that can hit the local markets, such as massive imports, or unexpected disruptions (see Box 2). However, in our sample, only four cases came out with a negative outcome, 3 of them in 2005 which was an unusual, quite erratic year in terms of price trends. As Chart 1 illustrates, the GCV currently appears to bear a very low level of risk in terms of price differential.

**Box 2 :**

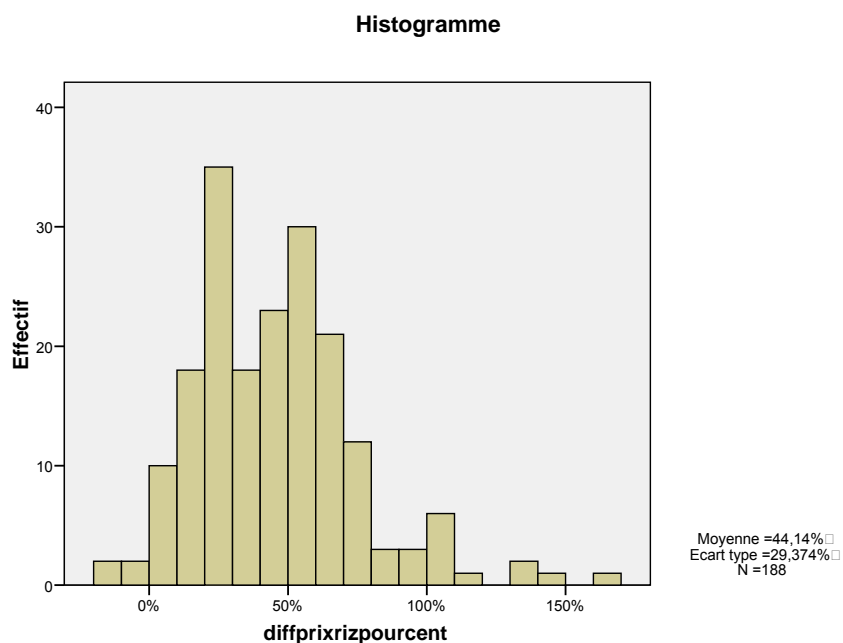
In one of the regions under study, an industrial rice compound was set up in 2005 (allegedly on the initiative of the president family). This compound temporarily disrupted the local market by crowding out the traditional traders out of aggressive marketing practices and setting up an artificial monopoly situation. This resulted in the price differential for year 2005 being almost null at the time when it usually reaches a peak. GCV borrowers who had waited until that time and could not wait any longer (or were concerned that the price would go further down) thus could realize hardly no gain on this level. However, the year after, the differential came back.

**Alaoatra region**

| Year | minimum price | maximum price | computing factor |
|------|---------------|---------------|------------------|
| 2003 | 250           | 300           | 150              |
| 2004 | 400           | 900           | 200              |
| 2005 | 450           | 500           | 300              |
| 2006 | 280           | 800           | 300              |
| 2007 | 480           | na            | 400              |

Source : Cecam regional office

**Chart 1 : price differentials (in % of initial price) – GCV 2003 -2007**



## Building market knowledge and marketing strategies

During in-depth interviews, many interviewees expressed that they are now paying more attention to the local variations of the paddy market, the identity and practices of the local traders, and that they build a strategy of storage and unstorage on the basis of this information. This can be interpreted as a spillover benefit of the GCV in terms of capacity building and economic empowerment.

*Two members who had been taking GCV for several years told us that they were now scheduling the unstorage of their rice stock once the price reached a pre-set threshold that they considered allowed them to win enough from the price differential side. As one of them put it, “the price might still go up afterwards, but there was some years when it went down, so this way, I am sure I get some benefit.” Several other members also mentioned a threshold strategy, but they were setting the threshold at a very high level which they themselves admitted had a low probability to happen.*

*On the other hand, a couple told us that they were trying to wait as long as possible (until January or February) to unstore their rice. They told us that usually there is a peak of GCV repayment in November and December because people need to sell the rice to pay for the next rice cycle. Local rice traders are now aware of that, and they can make arrangements among themselves to bring the prices down even though the trends are going upwards. By waiting long enough, the couple considered they could escape this and make the most benefit out of the price differential.*

## Food security

We built an indicator of food insecurity by combining two variables of the panel survey for 2006 and 2007 : 1. to have bought rice for family consumption<sup>7</sup> during the year preceding the survey, and 2. to have had trouble in financing the purchases of rice. Table 10 shows how food insecurity is distributed

<sup>7</sup> Purchases for other purposes (marketing, catering etc.), which accounted for 7% of the responses, were removed from the analyses.

across household wealth categories (for all households in the survey). In total, 54% of households buy rice to meet their family consumption needs, and out of the purchasers, 27% run into trouble to finance their purchases. In sum, almost one household out of 7 (15%) can therefore be considered as food insecure according to our definition. As expected, this rate is almost null for nonpoor households, and raises to 23 % for poor households. Although quite rough, our indicator thus appears to be reasonably robust.

**Table 10 : household food insecurity in 2007, by wealth categories**

|                                                   | N   | Rice purchase for family consumption <sup>a</sup> | HH found it difficult to finance purchase <sup>b</sup> | Food insecurity <sup>a</sup> |
|---------------------------------------------------|-----|---------------------------------------------------|--------------------------------------------------------|------------------------------|
| <b>Total households (members and non members)</b> |     |                                                   |                                                        |                              |
| Non poor                                          | 97  | 45%                                               | 7%                                                     | 3%                           |
| Medium                                            | 140 | 49%                                               | 28%                                                    | 14%                          |
| Poor                                              | 136 | 64%                                               | 36%                                                    | 23%                          |
| Total                                             | 373 | 54%                                               | 27%                                                    | 15%                          |
| <b>Cecam members using GCV in 2006</b>            |     |                                                   |                                                        |                              |
| Non poor                                          | 22  | 32%                                               | 0%                                                     | 0%                           |
| Medium                                            | 38  | 37%                                               | 14%                                                    | 5%                           |
| Poor                                              | 26  | 73%                                               | 21%                                                    | 15%                          |
| Total                                             | 86  | 47%                                               | 15%                                                    | 7%                           |

<sup>a</sup> : % out of total number of household for each wealth category. <sup>b</sup> : % out of the number of households that proceeded to rice purchases.

Source : Cecam impact study panel survey

We used this indicator to inquire into the food security status for households that had had a GCV the year before, and particularly the poor households. According to Table 10, while the rate of food insecurity in 2007 is 23% for all poor household (members and non members), it is only 15% for poor households who had a GCV with CECAM the year before (figures for year 2006 are 23% and 18% respectively – table not shown). On average, then, there appears to be a positive link between having access to a GCV and being in a better situation in terms of food security.

### ***Households who buy rice during the GCV period***

We thought at the beginning that the practice of buying rice during the GCV might indicate food pressure on poorer households that would have stored too much of their production (see Table 6). But the panel survey data show that all categories of households are involved, and that their purchases are made globally at the same prices (Table 11). The data thus do not allow to conclude that richer households buy at the beginning of the GCV to benefit from low prices while poorer household would buy at the end because they are running out of stock at home, and would do so at higher a price.

**Table 11 : rice purchases during GCV period**

|                 | Total N | % of households who bought rice during GCV | Price of rice bought |              |              |
|-----------------|---------|--------------------------------------------|----------------------|--------------|--------------|
|                 |         |                                            | 25th centile         | 50th centile | 75th centile |
| <b>Non poor</b> | 51      | 39%                                        | 373                  | 440          | 575          |
| <b>Medium</b>   | 96      | 34%                                        | 380                  | 420          | 510          |
| <b>Poor</b>     | 75      | 45%                                        | 358                  | 450          | 580          |
| <b>Total</b>    | 222     | 39%                                        | 380                  | 430          | 580          |

Source : Cecam impact study panel survey. Khi2 test non significant.

Qualitative data indicate that all categories of households can exhibit quite complex patterns of staggered purchases, sales and storage phases, which aggregate data at the survey level cannot capture (and which in-depth qualitative interview can capture only partially). We were able to identify several intertwined strategies related to the purchase of rice during GCV. The first one is related to

rice for family consumption. Around 2/3 of the 41 households kept a stock of rice at home aside from the GCV. The rationale put forward was twofold : one was to keep as much rice as possible for family self-consumption until the lean season, the other was to keep some stock as a form of liquid savings that could be used in case of emergency, thus providing flexibility and resilience. On the opposite, one third of households had stored all their production in a GCV and were buying the rice for family consumption, taking advantage of the low prices during the first months of the storage period. Intermediary situations were also observed, where purchased rice (at a low price) was stored in the GCV for future family consumption (10 cases, 25%). All three categories of wealth were represented in the different sections of the spectrum.

The second strategy underlying the purchase of rice during the GCV period is related to the economic activity of rice trading, as part of the diversification of the household activity portfolio. The GCV then can provide both a source of cash flow and a storage facility for part of the collected rice. Twelve households (29%) reported doing rice trading linked with the GCV. This strategy appeared to be associated mostly with non poor and medium households (there was only one poor household out of the 12).

## 5. Rationales and limits

Because it combines hybrid features of a commercialisation and a financial service, the GCV can serve different purposes, separately or more often in combination, alternatively or simultaneously. These include food security, but also cash-flow for productive activities or more generally household livelihood, and asset building. The following section is an attempt to present a stylized typology of how these different purposes are articulated within the three wealth categories of households, and the constraints that are associated.

### ***Poor households: forceful savings for food security***

For the poor households, the main rationale of the GCV is associated to forceful savings in order to smooth consumption and avoid too much pressure on the household food security status at the lean season.

*“If there is no GCV, it is too hard to keep the stock of rice at home. There are too many temptations to sell little by little.”*

The GCV credit can be used to repay the previous productive loan and to pay for small expenses (including rice for family consumption), but there are few cases of uses for starting or developing off-season activities (this can be due to the limited amount of the credit but also to a series of other barriers to diversification).

Even if it works on average, the strategy might prove complicated for some households, particularly the most vulnerable ones. First, if pushed beyond a certain limit, forceful savings can mean transferring the lean season to the storage period.

*One widow with 7 children told us that she deliberately kept no rice at home in order to save as much as possible for the lean season. But this translated into her self-constraining the family food consumption during the period of the GCV. Moreover, with no stock at home, she could not face some unexpected expenses that arose. Thus she had to unstore part of her GCV ahead of time, which prevented her to reap all the benefits associated with the price differential.*

Reimbursement of the GCV can also sometimes prove difficult. Data from both quantitative and qualitative surveys indicate that poor household tend to rely more on agricultural sources of income, and particularly on rainy season rice production, because of an array of barriers to productive diversification. For those households, paying back the GCV in the last trimester can prove difficult. A commonly reported practice is then to make an arrangement with a local trader to sell in advance the stock of rice. Those sales in advance can be conceptualized of as an informal loan<sup>8</sup>, and some

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<sup>8</sup> Interestingly, this kind of practice was identified only during the in-depth qualitative interviews. A possible reason might lie in the wording of the quantitative questionnaire : it was asked whether the interviewee had taken another loan to repay for the GCV. For the people, selling in advance is not

estimates of the implicit interest rate indicate that they can reach very high levels for a very short duration (often one day or two).

*Two people told us that the difference could be around 20 ar/kg. In the best case scenario, where the local price is highest, say 800 ar/kg, this makes for an implicit interest rate of 2,5%, often for a duration of only 1 to 2 days. One person mentioned that in her case, the difference had been as high as 100 ar/kg.*

Finally, poor households can cumulate credits from Cecam and other informal sources. According to the Cecam, accessing a productive credit allows to engage in rice cultivation without having to get a loan on the informal market in exchange for the advance sale of the rice production. However, the Cecam loan amounts might be constrained by the level of material collateral, and some households thus still complement the Cecam productive credit with some informal credit arrangement. In at least three cases, people were juggling with successive credits, using the most recent ones to repay the previous ones, and were on the verge of overindebtedness.

### **Medium households: forceful savings, food security and economic diversification**

For medium households, the forceful savings dimension of the GCV is also highly valued, although for a somewhat different reason than the poor households. Several households expressed that if the stock was kept at home, it was sold little by little and no relevant expense could be made out of it. This statement illustrates the importance of one-shot bulk amounts of money for investment strategies, which are not equivalent to several times a fraction of the same amount (Rutherford 1999).

*“What makes the GCV interesting is that one can wait until the price reaches a peak, and also that one can sell all at once rather than little by little. It is more interesting to have a lump sum at once, there is less risk to spoil it with irrelevant expenses than if we have several times smaller amounts.”*

As for the credit part of the GCV, the funds can be used both for ensuring the household food security and for improving the economic portfolio, including off-season agricultural activities, small livestock, nonfarm activities such as rice trading and milling, grocery stores, etc. Part of the GCV can also be used to strengthen the asset base, through purchases of oxen, small equipment, and land plots.

Although there are also cases of advance sales to rice traders to repay for the GCV, medium households generally can take advantage of their more diversified economic portfolio to plan for off-season incomes which will be used to repay the loan. Medium households can also cumulate credits from Cecam and other informal sources (particularly to finance the rice production), but are less exposed to the risk of over indebtedness than the poor. For the medium households, the main limit to the expansion of the GCV strategies often lies in the storage capacity.

### **Non poor households : forceful savings, high amounts of credit, and leveraging for economic diversification and expansion**

For nonpoor households, the meaning of forceful savings is the same as for the medium households. The issue of food security is not relevant any more for this category of households, and both the savings and the credit dimensions of the GCV can be used as an important leverage for expanding their economic activities and their asset base.

Nonpoor household have the financial capacity to repay the GCV without selling their stock in advance and thus are able to reap the full benefits of the GCV in terms of price differential. They can combine Cecam credit with other credits, generally from formal sources such as commercial banks, with little risk of over indebtedness. Like the medium households, they can face constraints in terms of storage

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equivalent to taking a loan, which might have induced an over rate of negative responses. Another reason might have been the reluctance to admit this kind of practice which might be negatively qualified by the Cecam staff (although the interviews were kept confidential). Qualitative interviews are more suited to create an appropriate dialogue setting, inducing people to talk more openly about sensitive issues.

capacities, but unlike the medium households, they have more capacity to invest in warehouse building.

## 6. Conclusions and operational implications

Evidence confirms the central role of the GCV among the Cecam members, across all wealth categories. The GCV is prominent in most credit trajectories and appears as the most popular credit product according to all categories of Cecam members. The flexibility in terms of collateral requirement, the lightness in the filing procedure, and the rigorous monitoring of the warehouses are particularly appreciated.

Differentiated households translate into differentiated strategies around a same financial product. This is all the more so that inventory credit is by itself a hybrid of marketing and financial service, and, as a financial service, can serve functions of credit and/or savings.

Quantitative evidence show that on average, the GCV is beneficial for all categories of members in terms of price differential. For poor households, this means mostly a gain in terms of food security, the GCV being used as a forceful savings device which allow them to economize on their global food expenses over the year. For richer households, this means better conditions of access to the rice market, thus fostering their monetary agricultural income which can be injected to their economic portfolio. For all households, the credit tied to the rice stored allows for additional cash flow which can be used to smooth consumption (including food purchase, but also social and schooling expenses), to engage in off-season productive activities, and even to invest in assets. While poor households mostly use the credit as a consumption smoothing device, non poor households, including, but not limited to, large rice producers, are able to take advantage of the leverage effect of the GCV to significantly foster their economic portfolio (including rice marketing) and make some productive investments.

There can be some drawbacks, though. First, as the GCV is very much appreciated by the non poor household, and the amount ceiling is much higher than for other Cecam credit products, there is a risk of big storers crowding out the smaller ones, particularly if financial resources are limited at the branch level. For the sake of equity, attention should be given to the credit officers incentive system in order to reward not only the aggregate amount of loan portfolio but also the number of loans.

Second, even though poor households value the GCV as a means to forcefully save rice for family consumption until the lean season, some of the most vulnerable might paradoxically find themselves under food pressure during the time of the loan. For the most vulnerable households, other, more focused food security instruments or programs than the GCV alone need to be called for. Also, poor households that are highly dependent on agricultural income, and unable to engage into remunerative off-season activities, may have a hard time reimbursing the GCV. They then turn to informal lenders or they sell in advance the rice stored in the GCV to a local marketers. This provides flexibility to the system, but at the cost of stripping part of the benefits of the GCV. Some members even suggested that taking up a credit in exchange for the rice storage should be optional, emphasizing the value given to the savings side of this financial product.

One last aspect has to do with the prospects of scaling up this kind of product. Currently, the main constraint for further scaling up of the GCV within the Cecam network is the lack of appropriate warehouse facilities. On the other hand, one of the most attractive feature of the GCV – the cyclical fluctuations that generate a seasonal price differential on the local market – is conditional upon the fact that the GCV system is not being expanded beyond a certain level. Massification could well put an end to the price benefits of the system. For policymakers and developers, the promises of the inventory credit might then be locked in a tricky dilemma.

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