



## Socio-Economic Determinants of the Market for the Poor (M4p) Systemic Approach on Rice Parboilers in the Tapoa Province in Burkina Faso

El Hadji Yoro Deme 

*Département Sciences économiques, Université Aube-Nouvelle, Ouagadougou, Burkina Faso*

Zila Issouf Guel

*Département Philosophie et Psychologie, Université de Ouagadougou, Ouagadougou, Burkina Faso*

### Suggested Citation

#### Suggested Citation:

Deme, E.H.Y. & Guel, Z.I. (2023).  
Socio-Economic Determinants of  
the Market for the Poor (M4p)  
Systemic Approach on Rice  
Parboilers in the Tapoa Province in  
Burkina Faso. *European Journal of  
Theoretical and Applied Sciences*, 1(4),  
263-276.  
DOI: [10.59324/ejtas.2023.1\(4\).26](https://doi.org/10.59324/ejtas.2023.1(4).26)

### Abstract:

M4P is a process-based approach to development that provides agencies and governments with the framework to implement lasting change. The aim of this research is to determine the effects of the probability of adherence to the Market for the Poor (M4P) systemic approach on the socio-economic performance of rice parboilers in the province of Tapoa in Burkina Faso. To achieve this, the methodological approach uses survey data from 160 rice parboilers and Logit-type modeling. The results show that the perceptions of the actors on the innovations introduced by the M4P approach are positive and its adoption also has a positive impact on income; the age of the respondent, the daily wage, the production capacity, the

quantity of hired labor positively and significantly affect the income of rice parboiling households in Tapoa. The State of Burkina Faso and the provincial authorities would benefit from working to strengthen the productive capacities of rice parboilers, through the popularization of the systemic approach (M4P) and the promotion of local rice in order to considerably improve the living conditions of all actors in the rice sector in Burkina Faso.

**Keywords:** *systems approach, sustainable change, rice parboiler, innovation, M4P, Tapoa.*

### Introduction

Rice is an integral part of human history. It is the first cereal in terms of human nutrition and is the staple food of nearly 50% of the world's population (Diop, 1997). In West Africa, the rice sector plays an important role in the economy in that it occupies a key place in the consumption of urban and rural households. Consequently, its production constitutes a source of income and an important component in the diet of many households (Massoud et al. 2013). In Burkina Faso, the Market for the poor (M4P) was

initiated on an experimental basis from 2017 to 2019 in the Eastern region by the NGO Helvetas to officially structure and facilitate market access for female rice processors in cooperatives, with the aim of adding value to the parboiled rice product and improving the incomes of rural households. This is why, after the implementation of the project in the East region, a general question arises for us: What are the effects of the M4P systemic approach on the socio-economic performance of women rice parboilers in the province of Tapoa? Specifically, it will be a question of answering the following



questions: (1) What is the contribution of the M4P to the improvement of the social situation of women rice parboilers? (2) What is the contribution of M4P to improving the economic situation of women rice parboilers? (3) What are the factors of viability and sustainability of the M4P approach at the level of rice parboilers?

## Materials and Methods

### Presentation of the Study Area and Sampling

This research concerns Tapoa where we have counted a total of eight (08) municipalities, with two types of grouping per municipality, which makes a total of sixteen (16) cooperatives

(including 08 cooperatives having adhered to the M4P approach and 08 other n not having joined). In each cooperative we have 30 women, which gives a total number of 480 women rice parboilers (including 240 members of the approach and 240 non-members). Thus, the parent population is 480 respondents present in our study area. We have selected one third (1/3) of the workforce of each cooperative formed in each of the municipalities in order to best meet our selection criteria and with the aim of better understanding its effects in the socio-economic realities of rice parboilers. As such, a reasoned choice sample (Table 1) of 160 parboiled rice producers (including 80 members of the approach and 80 non-members) was chosen.

**Table 1. Distribution of the Sample by Survey Area**

Survey area	Commune	Member cooperative workforce	Non-member cooperative workforce	Number of member cooperative respondents	Number of non-member cooperative respondents
Tapoa	Diapaga	30	30	10	10
	Kantchari	30	30	10	10
	Botou	30	30	10	10
	Partiaga	30	30	10	10
	Namounou	30	30	10	10
	Tambaga	30	30	10	10
	Logobou	30	30	10	10
	Tansarga	30	30	10	10
Total		<b>480</b>		<b>160</b>	

Source: authors

To collect the data, we were interested in all the structures from which we could gather informations relating to M4P in general. The survey took place during the month of September 2022. In addition, the interviews concerned members and non-members of the M4P approach as well as the managers of the RESIANE project.

Rice processing appears to be an important and strategic link for the overall development of the rice value chain. In Burkina Faso, this transformation was traditionally carried out by the State, but with the structural adjustment program of the 1980s characterized among other things by the disengagement of the public sector from the productive sectors, the rice husking

units managed by the latter were arrested. Paddy rice then suffered an unprecedented slump. And it is the women who have saved the sector by traditionally parboiling small quantities each week that they sell in the weekly markets of the production areas. Parboiled rice therefore occupies an important place among the post-harvest operations of paddy rice. Rice processing is an essential phase in the production of edible rice. It makes it possible to present a consumable product to the public, creates added value to paddy rice and thus increases the nutritional value and national production (DGESS/MAAH, 2020; UNERIZ, 2014).

This form of parboiling practiced by women should guarantee food security and provide the

income needed to improve their living and working conditions. It is a subsistence activity with little market access. Training, research and development efforts have focused for decades on increasing productivity because it was necessary to generate growing and secure revenues given the constant increase in the financial needs of rural actors. This is how the importance of the processing and marketing activities of the products of agricultural enterprises became apparent (Scott and Griffon, 1998).

This particular dynamic has resulted in the introduction of new production and processing technologies thanks to funding from the West Africa Agricultural Productivity Program (WAAPP), in order to help improve rice parboiling processes. It is also with this objective that the Consortium Action contre la Faim and the Non-Governmental Organization (NGO) HELVETAS, through the RESIANE action "Strengthening in a sustainable and integrated manner the resilience of populations vulnerable to nutritional insecurity in the eastern region of Burkina Faso", were interested in promoting the economic development of rural areas and in creating, with small producers and local processors, an environment and conditions favorable to their economic initiatives. Thus, HELVETAS has set up the "Make Market For the Poors" approach, focused on structuring women processors and facilitating their access to the market through reinforcement training and services adapted to control their production of parboiled rice in upstream and downstream.

### Analysis model

The analysis model used to explain the choice of joining the M4P is of the Logit type. Indeed, three models have been frequently used to analyze choice decisions. These are linear probability models, in particular the Logit model, the Probit model and the Tobit model (Ngondjeb, Nje & Harvard, 2011; Jacquot, 2000; Bourbonnais, 2011; Barry, 2016; Dème and Yerbanga, 2022). However, the use of multinomial type models has become common in the literature. The first two models have similar characteristics according to Amemiya

1981, the only difference being at the level of the laws of probability; the normal law for the Probit model and the logistic law for the Logit model. The coefficients of the Probit model and the Logit model are therefore linked by a constant equal to 1.6. The use of the Tobit model requires that we have information on the phenomenon of adoption of M4P, better than we have information on the intensity of use of the M4P approach (Dème and Yerbanga, 2022).

To analyze the determinants of M4P membership, we start from an econometric model. Formally, adoption is considered to be modeled as follows:

Adoption of the M4P approach :

*Adoption de l'approche M4P :*

$$A_i = \begin{cases} 1 & \text{si } A_i^* > 0 \\ 0 & \text{si } A_i^* \leq 0 \end{cases} \quad A_i^* = X_i\beta + \varepsilon_i \quad (1)$$

Where  $\varepsilon_i$  is the error term with zero mean and unit variance.  $E(\varepsilon_i / X_i) = 0$  and  $V(\varepsilon_i / X_i) = 1$ , and  $A^*$  represents the latent variable of adoption. In this regard,  $A^*$  represents the net gain expected by the parboiler adopting the M4P approach. Nevertheless, only the choices  $A_i = 1$  if the producer chooses adoption,  $A_i = 0$  otherwise are observed.

$X_i$  represents the explanatory variables, determinants in the economic and social component likely to explain the membership status of rice parboilers for the M4P. These were: (i) age of the steamer (AGE), (ii) marital status of the rice steamer (SIMAT), (iii) experience of the steamer (EXPERIENCE), (iv) the parboiler's household size (TMEN), (v) the rice parboiler's level of education (NIV\_INSTRUCT), (vi) the parboiler's family health expenses (DEP\_SANTE), (vii) education expenses of the children of the parboiler's family (DEP\_EDUC), (viii) food expenses of the parboiler's family (DEP\_ALIM), (ix) access to credits in financial structures by the chief steamer (CREDIT). The dependent variable is the adoption variable characterizing adherence to M4P.

Consider the case where the parboiler opts for M4P membership,  $A_i = 1$ ). The probability  $p$  is therefore given by  $P(A_i = 1)$ . Which means that  $P(A_i^* > 0) = P(X_i\beta + \varepsilon_i > 0)$ . We therefore have  $P(X_i\beta > -\varepsilon_i) = F(X_i\beta)$  with  $F$  the distribution function of the normal law. The functional specification of the normal distribution is given by

$$P(A_i^*) = F(X_i\beta) = \int_{-\infty}^{X_i\beta} \frac{e^{-t^2/2}}{\sqrt{2\pi}} dt \quad (2)$$

The formal model to be estimated is therefore given by

$$P(X_i\beta > -\varepsilon_i) = \int_{-\infty}^{X_i\beta} \frac{e^{-t^2/2}}{\sqrt{2\pi}} dt. \quad (3)$$

Statétuv or staprodrizicol =  $f(\text{age}, \text{simat}, \text{experience}, \text{tmen}, \text{niv\_instruct}, \text{revan}, \text{dep\_sante}, \text{dep\_educ}, \text{dep\_alim}, \text{credit},)$

$$P(A_i = 1) = F(\alpha_0 + \alpha_1 \text{AGE}_i + \alpha_2 \text{AGE2}_i + \alpha_3 \text{SIMAT}_i + \alpha_4 \text{EXPERIENCE}_i + \alpha_5 \text{TMEN}_i + \alpha_6 \text{NIV\_INSTRUCT}_i + \alpha_7 \text{LOGDEP\_SANTE}_i + \alpha_8 \text{LOGDEP\_EDUC}_i + \alpha_9 \text{LOGDEP\_ALIM}_i + \alpha_{10} \text{LOGREVAN}_i + \alpha_{11} \text{CREDIT}_i) \quad (4)$$

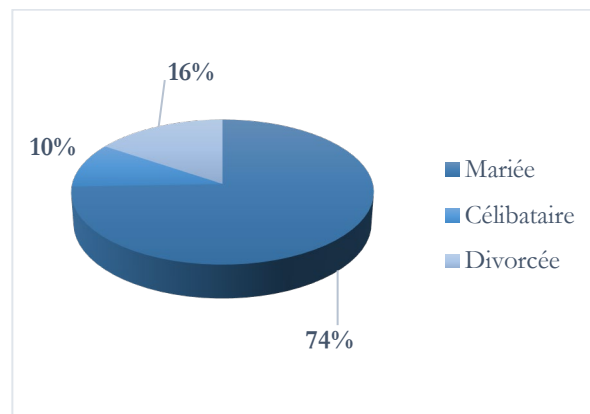
## Results

The results are presented in two parts. First, the descriptive statistics of the sample variables of this research are provided. Second, we present the specification tests of the econometric model, the estimation of the Logit model by the maximum likelihood estimation method and the marginal effects of each of the explanatory variables and their effects on the decision to join M4P.

### Descriptive Statistics

Figure 1 below presents the distribution of our sample according to marital status. Analysis of this figure shows that 74% of women in our

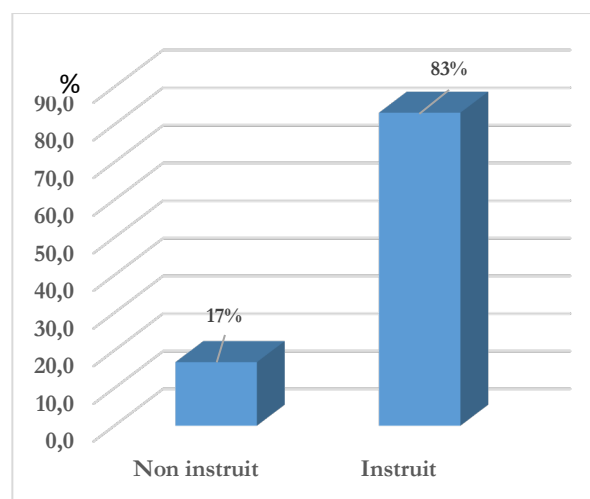
survey population are married (or widowed). This is explained by the fact that to launch the project, Helvetas used married direct actors because of their responsibility as housewives and the advantages they will be able to enjoy thanks to their integration into the process.



**Figure 1. Distribution of the Sample According to Marital Status**

Source: authors

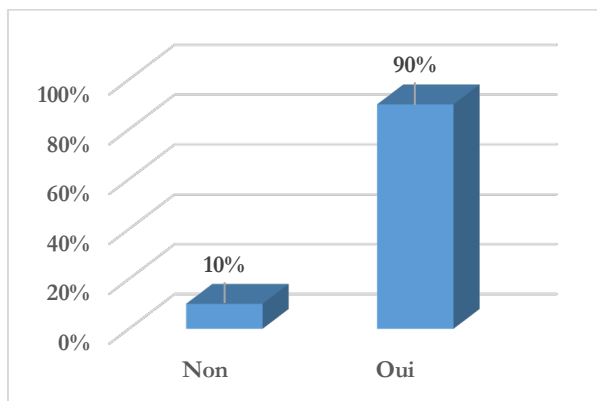
Figure 2 below presents the educational level of the rice parboilers in our sample. Indeed, it shows that 83% of our population is educated. This could explain the good understanding and enthusiasm in adopting the M4P approach for women rice parboilers.



**Figure 2. The Educational Level of the Sample**

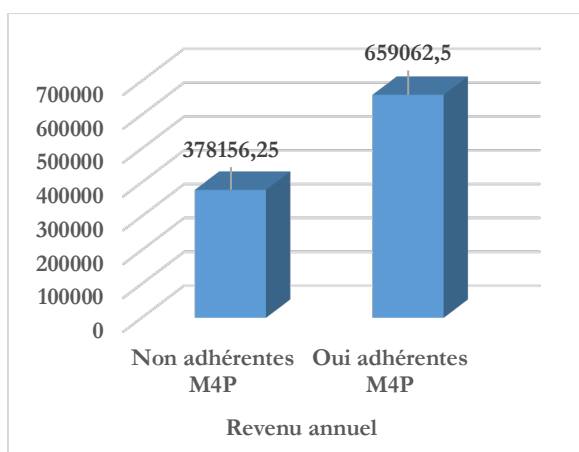
Source: authors

Figure 3 below shows rice parboilers' access to credit. Indeed, it shows that 90% of the survey population has access to credit thanks to the M4P approach. The organizational and technical capacity building facilitated by the approach enabled the parboilers to be better organized and solvent vis-à-vis microfinance institutions.



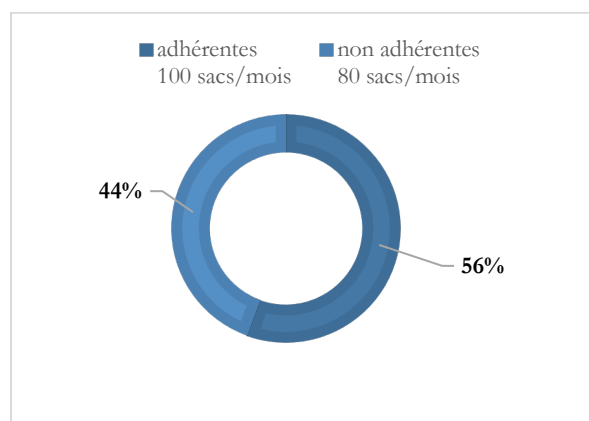
**Figure 3. Access to Credit**  
Source: authors

Figure 4 below shows the annual income of rice parboilers. The analysis of this figure shows that parboilers who are members of the M4P have an annual income that is much higher than that of non-member parboilers due to the increase in market share garnered with large restaurateurs and wholesalers, thanks to the various connections facilitated approach, which helps to obtain substantial financial margins.



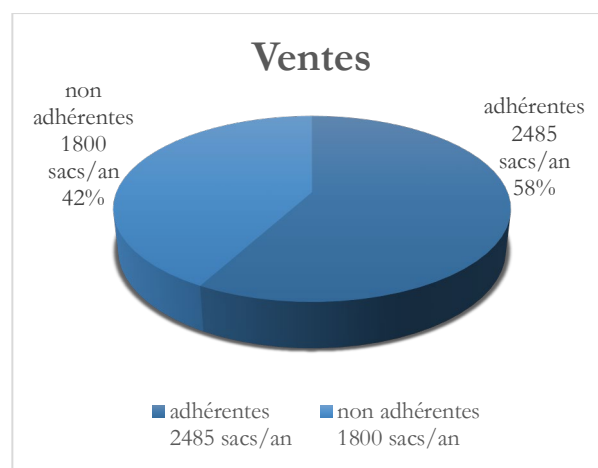
**Figure 4: Annual Income**  
Source: authors

Parboilers adhering to the M4P approach produce 100 bags of rice per month compared to non-adhering parboilers who produce 80. This can be explained by the M4P approach which not only facilitated the partnership between the production and processing links of rice but also the reinforcement in terms of technical skills of these parboilers in order to enable them to produce in quality and quantity (figure 5).



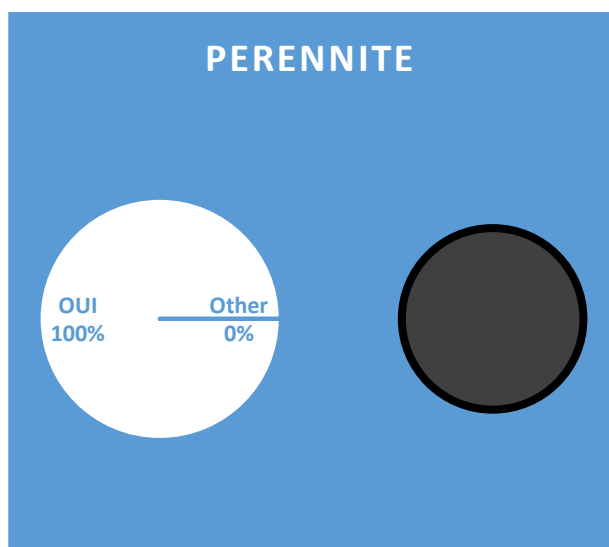
**Figure 5. Quantities Produced**  
Source: authors

Parboilers adhering to the M4P approach sell an average of 2,485 bags of rice per year compared to non-adhering parboilers who sell 1,800. This can be explained by the importance of sales at the level of the member parboilers (figure 6).



**Figure 6. Annual Sales**  
Source: authors

Figure 7 below shows the response of parboilers who are members of the M4P on the sustainability of the approach. Of the 80 parboilers who are members of M4P, all are unanimous on the fact of using this approach for a long time because it is beneficial to them. Indeed, they claim that the M4P has facilitated the granting of better living conditions in terms of food, health, clothing and access to education...



**Figure 7. The Sustainability of the M4P Approach**

Source: authors

### Econometric Analysis

It is first a question on this point of testing the specification of the econometric model, then of proceeding to the estimation of the Logit model by the method of estimation of the maximum likelihood and finally of calculating the marginal effects of each of the explanatory variables and to interpret the effects on the binary endogenous variable "statprodrizicol".

Econometric specification of the estimated model:

$$statprodrizicol = P(A_i = 1) = F(\alpha_0 + \alpha_1 AGE_i + \alpha_2 AGE2_i + \alpha_3 SIMAT_i + \alpha_4 EXPERIENCE_i + \alpha_5 TMEN_i +$$

$$\alpha_6 NIV\_INSTRUCT_i + LOGDEP\_SANTE_i + \alpha_8 LOGDEP\_EDUC_i + \alpha_9 LOGDEP\_ALIM_i + \alpha_{10} LOGREVAN_i + \alpha_{11} CREDIT_i) \quad (5)$$

If we note  $X_{95\%}^2(11)$  the 95% quantile of the chi-square distribution, the Wald test or "LR chi2 (11)" at the 5% threshold of the null hypothesis consists in accept the null hypothesis if the quotient of  $\frac{(\beta_j - \alpha)^2}{\theta_{ij}}$  is less than  $X_{95\%}^2(11)$ , and to reject the null hypothesis if this quantity is greater than  $X_{95\%}^2(11)$ . It therefore makes it possible to test the nullity of the parameters of the estimated logit model. The Logit model estimate gives a critical probability p-value = 0.000. So, at the risk of 1% we reject the null hypothesis of nullity of the coefficients. Similarly the pseudo- $R^2$  suggested by McFadden (Pseudo  $R^2$ ) is equal to 31.72% or 0.3172. It can therefore be concluded that the model is well specified.

The Hosmer-Lemeshow test consists of testing the quality of the model fit. This test involves rejecting the null hypothesis of good fit of the model if the probability associated with the chi-square value is less than  $\alpha$  at the 5% threshold or accepting the alternative hypothesis of bad fit in the opposite case. In this study we notice that the critical probability p-value is 0.7812, which is greater than  $\alpha$  at the 5% threshold. So we can conclude that the estimated Logit model fits well.

In total, the probability of good predictions of 1 and 0 of the dichotomous endogenous variable is 76.73%. This confirms that our forecast of 1 for poor households and 0 for non-poor households is largely significant.

Table 2 gives the estimation results of the Logit model of the socio-economic effects of the market for the poor (M4P) systemic approach on rice parboilers in the province of Tapoa.

The results of the selection model in the first stage made it possible to identify the variables explaining the probability of adhering to the M4P by rice parboilers, through a bivariate Logit estimation model. We note that variables such as marital status, level of education, food

expenditure significantly explain the status of adherence to the M4P program by rice parboilers at the 5% level. The constant is also significantly different from zero at the 1% level. Similarly, the variables of the number of experience of rice parboilers and health expenditure in logarithm

are significantly different from zero at the 1% level. Finally, the variable the annual income of rice parboilers in logarithm significantly explains the membership status of the M4P program by rice parboilers at the 10% threshold.

**Table 2. Result of Bivariate Logit Estimation**

Variables	Coefficient	P> z
age	1.187695 (0.1632474)	0.211
age2	0.9978851 (0.0015281)	0.167
simat	1.926961** (0.6027929)	0.036
experience	1.391732*** (0.1457604)	0.002
tmen	0.9696997 (0.0358869)	0.406
niv_instruct	0.2177076** (0.1341703)	0.013
logdep_sante	2.468696 *** (0.5233987)	0.000
logdep_educ	0.9331783 (0.1601326)	0.687
logrevan	1.344453* (0.2335275)	0.088
credit	2.285576 (1.645874)	0.251
logdep_alim	2.068737 ** (0.7203625)	0.037
_cons	1.33e-12*** (9.48e-12)	0.000

**Note:** The standard deviation values in parentheses and the significances: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Source:** authors

The results of the regression show that the number of years of experience of the rice parboilers positively influences the membership status of the M4P program by the rice parboilers. In other words, the longer the rice parboilers are in operation or the number of years of experience of the rice parboilers, the less the rice parboilers are willing to be non-members of the M4P program. We also find that health expenditure has a positive effect on M4P membership status. This explains why the higher the health expenditure, the more the rice parboilers are more likely to join the M4P program. Indeed, the increase in this observed

variable allows us to say that for those who are in the M4P process, they earn significant income so that these individuals can take care of health care. We observe that food expenditure has a positive and significant influence on M4P membership status. This state of affairs is explained when the more the food expenses increase then the rice parboilers are more likely to join the M4P and therefore those of the rice parboilers being in the M4P program manage to obtain substantial incomes so that this that they can ensure their own consumption and additional purchases of food for their families. So, with regard to the marital status, it appears

that more, parboilers with married status (widower included) compared to women with other marital statuses positively influence M4P membership status. This shows that married

status (including widowed) is more willing to be in the M4P program than those with single and divorced status.

**Table 3. Estimation Result of Marginal Effects**

Variables	dy/dx	P> z
age	0.043003 (0 .03436)	0.211
age2	-.0005293 (0.00038)	0.167
simat	0.1639831** (0.07819)	0.036
experience	0.0826358*** (0 .02619)	0.002
tmen	-0.0076921 (0.00925)	0.406
niv_instruct	-0.3430189*** (0.11257)	0.002
logdep_sante	0.2259186*** (0.053)	0.000
logdep_educ	-0.0172894 (0 .0429)	0.687
logrevan	0.0739955* (0 .04342)	0.088
credit	0.1987875 (0.15973)	0.213
logdep_alim	0.1817314** (0.08706)	0.037

**Note:** The significances: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Source:** authors

Table 3 gives the estimates of the marginal effects of the different variables used on the endogenous binary variable “M4P membership status”. We notice that some of our variables remain significant, but at different significance thresholds. If we move on to rice parboilers with married status (including a widower), the probability of joining the M4P program increases by 0.16%, all other things being equal. This can be explained by the fact that rice parboilers with married status (including a widower) encourage those with single and/or divorced status to join the M4P program because the responsibilities are important as women. at home so they seek to acquire the advantages offered by the approach. We also note the marginal effect that when the length of seniority increases by one (01) year, then the probability of joining the M4P increases by 0.082, all other

things being equal. This implies that rice parboilers who are older in terms of experience would adopt technologies more easily than younger ones.

### Discussion

M4P is an approach to developing market systems that works more effectively, more sustainably and more profitably for the poor, providing them with the capabilities and opportunities to improve their lives. This approach, applicable to development organizations and governments working in both economic and social fields, is defined by a number of important characteristics. M4P is an approach to development that provides a conceptual framework not only for understanding the situation of the poor in the



context of market systems (analysis), but also for how to bring about effective change (action) (The Springfield Centre, 2015). The analysis should identify and address the underlying systemic constraints that affect market systems. His focus is on the development of market systems, assessed taking into account the different market functions and actors: public and private, formal and informal. This systemic character of M4P defines many of its most important characteristics. By addressing the underlying causes (rather than the symptoms) of poor performance, M4P seeks to trigger large-scale change. The M4P systemic approach is an approach that aims for the sustainable and effective improvement of the living conditions of the poor through the analysis of the value chains of the sectors and by acting on the market systems. The targeted targets mainly concern young people and women, vulnerable groups most affected by idleness, unemployment and poverty; producer groups and farmers' organizations (POs) and processing units. The M4P approach makes it possible to better identify all the bottlenecks and specific constraints allowing them to be taken into account in the marketing circuits of promising sectors.

The Making Markets Work For the Poor (M4P) approach, which refers to "making markets work for the poor", is an approach to developing market systems, so that they work better for the benefit of the poor and provide them with the capacities and opportunities to improve their living conditions. Built on a deep understanding of market systems and a clear vision of the future, M4P enables agencies to identify systemic sticking points and bring about lasting change on a large scale (The Springfield Center, 2015). M4P is both a strategic reflection, a conceptual framework for analyzing market systems and an intervention guide. However, it is neither a recipe nor a fixed tool; it is a flexible and adaptable approach, likely to be used both in the economic field (agriculture, finance, general investment environment, and subsistence economy), as well as in the social field (water management, health, education) (The Springfield Centre, 2015).

Furthermore, in order to introduce systemic changes in a market, it is necessary to develop a vision for a more efficient, more inclusive and fairer market system and to cooperate at different levels with key market actors in order to achieve this goal independently. Thus, systemic challenges to a market system involve a wide range of actors and solutions require coordinated action, it is absolutely essential to involve all relevant actors in the process of understanding the whole system, identifying and responding to challenges and exploiting opportunities. Real participation of market actors and their real ownership of this process is essential to sustain the transformations once the project aimed at facilitating the transformation of the market system has ended. The M4P approach aims, among other things, to help market players build relationships, implement collaborative actions, provide them with infrastructure and introduce new technologies. These measures improve their ability to continuously improve their productivity and therefore the competitiveness and sustainable strengthening of the economic and social gains of market systems. In practice, this is primarily to avoid entering the market system as an NGO and introducing problematic or missing market functions. This is why the approach targets the factors that fundamentally block the effective development of market systems in a context of poverty (The Springfield Centre, 2015).

However, beyond this very general definition, there is no real consensus on what M4P is, its characteristic components or its potential ambitions. After several years of implementation, it appears necessary to provide clarification. On the one hand, M4P is a global approach, likely to apply to a very wide range of socio-economic development areas. It is not a specific and normative tool. On the other hand, insofar as there is currently a strong current for the idea of "making markets work for the poor", and considering that development activities aim to reduce poverty, which often involves the markets and can come under the M4P approach.

The M4P approach has its origins in the discussions of the mid-1990s on the realization that donor practices were not particularly

effective for private sector development. They tended to create situations of unfair competition between pre-existing service providers and programs or organizations heavily subsidized by governments (Meyer-Stamer & Wältring, 2006). The case for agencies and governments to adopt the M4P approach stems from two factors: (i) lessons learned from a wide range of implementation experiences on what works (and what does not) and (ii) successes in implementing the M4P approach. First of all, through various development experiences and in various fields from agriculture to financial markets, including drinking water supply, sanitation and health, the same conclusions emerge. Many efforts, both in direct intervention and in remote reform, have failed, resulting in unsatisfactory results, in terms of coverage, impact and sustainability, and in distorting rather than developing markets. The lesson to be learned from these experiences is that agencies and governments must ground their actions in the reality of market systems, and focus on facilitating systemic change (Meyer-Stamer & Wältring, 2006). Second, there is growing evidence that M4P works. Large-scale programs in various contexts and market systems have explicitly employed the M4P approach, and agencies and governments influenced by its core principles have succeeded in inducing significant change. These changes are evident in the high rate of coverage and impact. More importantly, in each case, the capacities and incentives that have been developed prove to be sustainable, implying an intensification of positive impacts in the future. The M4P approach is not a panacea, and there are still many points to debate on its implementation. Nevertheless, taken together, these elements highlight the value of the approach in correcting errors in the analysis of market systems, introducing a more positive (but realistic) vision of their roles, and determining the optimal way in which they can work to the benefit of all, and the poor in particular (Meyer-Stamer & Wältring, 2006).

Our research shows that when annual income (in logarithm) increases by 1%, the probability of joining M4P increases by 0.073% all other things being equal. Thus income positively influences

the level of well-being, all other things being equal. In addition to this, the expected sign was the positive sign because the more the income increases, the more capital the actor will have to invest. This result could lead to the strengthening of the use of loanable fund offers in financial institutions for investments or for the purpose of savings. This joins the work of Gibson A (2005), Gibson A (2006) and Anderson and Hitchins (2007).

Gibson (2006) assessed the impact of M4P on financial services coverage in South Africa in the context of low financial services coverage (38% initially) for low-income groups keeping these at the distance from the dominant economy and which constitutes a limiting factor in their contribution to growth. The aim was to improve the functioning of financial services markets for the benefit of the poor. For this, the actions carried out were to establish a shared vision of the future of the sector; support innovation in terms of services offered, develop information services, improve the regulatory process and stimulate consumer education. The results of Gibson (2006) show that M4P contributed to the opening of 7.1 million new bank accounts; the creation of new information services; strengthening the role of the State and creating the conditions for an environment more favorable to innovation.

Anderson and Hitchins (2007) studied the impact of M4P on the quality of business radio programs in Uganda in a context where poor quality radio programs limit the flow of economic information and accountability. As a result, the main actions were to work with a small number of radio stations, to improve the innovation and quality of programs; demonstrate the profitability of the model and train other players and strengthen other market functions (audience research, journalism, etc.). The objective was to sustainably improve the quality and relevance of commercial radio programs. The results obtained by Anderson and Hitchins (2007) show that 50 new programs have been developed, offered by 25 stations and reaching 7 million additional listeners.

M4P's view of market systems as multi-function, multi-actor arrangements draws directly on the institutional economics approach. Williamson (1970, 1971), founding father of this theory, asserts that institutions are defined as constraints imposed by society, either its explicit or implicit rules. A market is one of these institutions with a set of rules that govern the exchange. Institutional economic theory establishes that markets are much more than pricing mechanisms; prices result from the way markets work, which, in turn, is determined by how well markets reduce transaction costs and the costs of exchange. Transaction costs are to be distinguished from the production costs of a good or service, which remain constant regardless of the buyer. Transaction costs vary only according to the type of buyer/seller exchange, and take two main aspects: the costs occurring before the transaction or the so-called ex ante costs corresponding to the search for consumers and sellers, the negotiation to arrive to an agreement and its contractualisation. The importance of these costs in relation to the transaction itself and their distribution between buyers and sellers determines the nature of the specific market for a good or service. What the M4P approach suggests, in our view, is that these costs can disproportionately affect the ability of the poor to participate in these markets. If we move to rice parboilers where the rice parboilers are educated or either the rice parboilers uneducated the probability of adhering to the M4P decreases by 0.34 all other things being equal. However, the level of education can be a determining variable in the adoption of innovations. It increases the sense of innovation, the skill and the ease of appreciating new technologies, which is in line with the results of Falusi (1975) and Rahm and Singh (1988). When health expenditure (in logarithm) increases by 1%, then the probability of adhering to M4P increases by 0.22% all other things being equal. Access to health care is further strengthened with the support of M4P, which brings major innovations in terms of outlets for sales in rice parboiling. From there, these producers manage to market the rice products and benefit from a substantial income to ensure their health care. When food expenditure (in logarithm) increases

by 1%, then the probability of adhering to M4P increases by 0.18%, all other things being equal. The M4P contributes to increasing the productivity of rice parboiling units; production has increased from 10 bags of rice to 100 bags of rice per year. Also, joining the M4P approach contributes to improving the economic and social situation of the rice parboilers because the economic situation of the parboilers who are members has evolved considerably. Indeed, the parboilers claim that the M4P approach has facilitated the granting of better living conditions to their respective families in terms of food, education, health and even clothing. The M4P approach is viable and sustainable at the parboiler level and they want to continue with the M4P approach for a long time.

The various projects and support initiatives for women rice parboilers with the implementation of the M4P approach have enabled the opening of local outlets for producers, the resolution of local rice processing difficulties for the strengthening and modernization of traditional parboiling systems for a better quality of processed rice, the production of local added value on the rice produced in Burkina Faso. Ultimately, it appears that a number of preconditions must be met for rice parboiling to be an effective and sustainable solution for the economic empowerment of women. Indeed, evolutionary theory is inspired by biology and focuses on the phenomena of interdependence, competition and change in market systems. This is a significant step forward in moving beyond the static analysis of conventional economic theory to examine the reasons for dynamism within systems, with a focus on the process of change inherent in economic development. It examines the aspects of the transformation, not of raw materials, but of ideas, of knowledge, which determine the way in which a "system" functions. The parallel with the M4P approach is therefore multiple here, in particular the concept of "creative destruction" to be compared to the catalysts of change of M4P and "disruptive innovation" (Schumpeter (1912); Schumpeter (1942)). Other points strongly link them to the M4P approach (and to institutional theory), in the established dichotomy between ceremonial

and instrumental, where the term ceremonial designates patterns of past activity or precedents (in clear: institutions) and that of instrumental refers to technological imperatives and their consequences in the future (in short: innovations). Even more, evolutionary economics, by emphasizing the evolving nature of markets, sees the essential role of mechanisms that sustain dynamism (e.g., selection, genesis of innovation and variety, diffusion and reproduction, etc.), which comes very close to the importance for M4P of multi-function and multi-actor systems, sustainability analyzes and the perception that markets are evolving towards ever greater complexity and sophistication.

## Conclusion

M4P is a development approach that provides agencies and governments with the framework to implement lasting change. The overall objective of this research was to analyze the effects of the M4P approach through the RESIANE project on the socio-economic performance of parboiled rice processors in the province of Tapoa in Burkina Faso. The results obtained show that the adoption of the M4P approach has a positive impact on the income of rice parboilers in the province of Tapoa. Before the adoption of the M4P approach, parboiling of rice was done traditionally and women were unable to sell their products. These results confirm the impact of M4P on company performance, in accordance with the results obtained by Gibson (2005), Gibson (2006), Anderson and Hitchens (2007). In addition, our results reveal that the age of the respondent, the daily wage, the production capacity, the quantity of hired labor positively and significantly affect the income of rice parboiling households in Tapoa. This research provides a number of policy implications. Thus, to achieve a significant reduction in poverty, particularly at the level of rice parboilers in the province of Tapoa, the provincial authorities must work to strengthen the productive capacities of rice parboilers, through the popularization of the systemic approach. (M4P). During our study, we succeeded in analyzing the existing relationships

between the actors while identifying the constraints they encounter. Ultimately, it appears that a number of preconditions must be met for rice parboiling to be an effective and sustainable solution for women's economic empowerment. Rice has become a major staple food in West Africa, especially in Burkina Faso; urbanization, rising household incomes, changing lifestyles and food preferences have fostered a shift towards rice and away from traditional cereals and changing food consumption has been an important driver rice trade. The Burkinabè State would therefore benefit from establishing partnerships with structures such as Helvetas in order to better promote local rice and considerably improve the living conditions of all actors in the rice sector in Burkina Faso. In order to effectively improve the M4P approach, and by extension the parboiled rice market system, it would be interesting to: (i) continue business dialogues at the local level because they make it possible to identify palliative commercial strategies for collection and distribution of parboiled rice with potential actors; (ii) sustain the Market Systems Development (DSM or M4P) approach by including the business development services (BDS) model that meets the expectations of vulnerable populations; (iii) prioritize partnerships with SDAs/PSLs (local service providers) because they benefit from service contracts with other technical partners at the local level; (iv) increase advocacy and lobbying with community authorities to target institutional orders in order to facilitate the sale of their products and make substantial margins; (v) participate in fairs to promote parboiled rice and build relationships with partners to ensure sustainable markets; (vi) creating gender sensitive agricultural support services; (vii) strengthen women's enterprises by making them more flexible and proactive in order to adapt to the needs of employees; (viii) improve women's access to appropriate financial products and services; (ix) strengthen the technical, organizational and strategic capacities of women's professional organizations; (x) improve the framework conditions for agricultural entrepreneurship while influencing the policy and legal environment at the national level; (xi) promote the SDA/PSL model with donors, in

this context of insecurity, for the implementation of new projects in the region; (xii) continue to facilitate the connection between key players (Producers, Steamers and traders) and support and regulatory players (Technical Partners, Financial Partners, technical services, etc.) for a strong market system, with win-win business opportunities.

## Acknowledgement

We warmly thank: the entire faculty of the AGRINOVIA Program, in particular Pr Jacques NANEMA; Mr. Etienne ZOUNDI, Deputy Country Director of Helvetas Burkina Faso; Mr. Modibo OUEDRAOGO, Youth Employment and Income Domain Coordinator at Helvetas Burkina Faso for his support through the sharing of experiences and knowledge; NGO staff, Helvetas Burkina Faso, Action contre la Faim (ACF), Tin-Tua and GRET Burkina Faso for collaboration and information exchange; the producers, parboilers and traders who are members of the rice value chain cooperatives in the province of Tapoa for their efforts in answering our many questions and especially for their availability, despite the difficult situation due to insecurity; and the various officials of the structures met on site in Diapaga and Fada N'Gourma, in particular those of the town halls and the Provincial Directorates of Agriculture and Food Security.

## Conflict of interest

The authors have no conflict of interest.

## References

- Amemiya, T. (1981), Qualitative Response Model: A survey *Journal of Economic Literature*, 19(4), 1483-1536.
- Anderson, G. & Hitchens, R. (2007). *Making Markets Work for the Poor: Expanding the poor's access to business information and voice through FM radio in Uganda*. Case Studies Series. Retrieved from <http://www.springfieldcentre.com/wp-content/uploads/2012/10/sp0701.pdf>
- Barry, S. (2016). Déterminants socioéconomiques et institutionnels de l'adoption des variétés améliorées de maïs dans le Centre Sud du Burkina Faso. *Revue d'Economie Théorique et Appliquée – RETA*, 6(2), 221 - 238.
- Dème, H.Y. & Yerbanga, A. (2022). Déterminants de l'adoption des techniques de conservation des eaux et des sols par les producteurs dans les régions du Centre et du Plateau Central au Burkina Faso. *Annales de l'Université de Parakou – Sciences économiques et de Gestion*, 7(1), 47-72.
- DGESS/MAAH. (2020). Tableau de bord statistique de l'agriculture 2019. Retrieved from [http://cns.bf/IMG/pdf/tab\\_bord\\_agriculture\\_2019\\_def.pdf](http://cns.bf/IMG/pdf/tab_bord_agriculture_2019_def.pdf)
- Fall, A.A. (2016). Rapport final synthèse des études sur l'état des lieux de la chaîne de valeur riz en Afrique de l'Ouest. Retrieved from [https://www.inter-reseaux.org/wp-content/uploads/rapport\\_final\\_synthese\\_regionale\\_riz\\_finale.pdf](https://www.inter-reseaux.org/wp-content/uploads/rapport_final_synthese_regionale_riz_finale.pdf)
- Falusi, A.O. (1975). Application of Multivariate Probit to fertilizer use decision: Sample survey of farmers in three states in Nigeria. *Journal Rural Economic Development*, 9(1), 49-66.
- Diop, A., Hounhouigan, D. and Kossou, K.D. (1997) Manuel de Reference pour Technicien Specialises: Technologie Post-recolte et Commercialisation des Produits Vivriers. *ADA Experts-Conseils, Quebec*, 89-109.
- Gibson, A. (2005). Bringing Knowledge to Vegetable Farmers Improving embedded information in the distribution system. Retrieved from [https://beamexchange.org/uploads/filer\\_public/84/c6/84c620b3-b651-4438-9fc0-7d99c715ae1d/evidence\\_katalystvegetable.pdf](https://beamexchange.org/uploads/filer_public/84/c6/84c620b3-b651-4438-9fc0-7d99c715ae1d/evidence_katalystvegetable.pdf)
- Gibson A. (2006). Making Markets Work for the Poor: Developing financial services markets for the poor: FinMark in South Africa. Retrieved from <https://www.shareweb.ch/site/EI/Documents/HowTo/M4P-MSD/SDC%20-%20Case%20Study%20-%20M4P%20-%20Developing%20Financial%20Services%20Markets%20for%20the%20Poor%20FinMark>

[%20South%20Africa%20-%202006%20\(en\).pdf](#)

Jacquot, A. (2000). *Les modèles économétriques-logit-probit-tobit*. Bureau des prévisions

Massoud, M.R., Nielsen, G.A., Nolan, K., Nolan, T., Schall, M.W. & Sevin, C. (2006). *A Framework for Spread: From Local Improvements to System-Wide Change*. IHI Innovation Series white paper. Cambridge, Massachusetts: Institute for Healthcare Improvement.

Meyer-Stamer, J. & Wältring, F. (2006) *Analyse de la chaîne de valeur et faire fonctionner les marchés pour les pauvres' (M4P) – Réduction de la pauvreté par la promotion de la chaîne de Valeur*. GTZ, Eschborn.

Ngondjeb, Y., Nje, P. & Harvard, M. (2011). Déterminants de l'adoption des techniques de lutte contre l'érosion hydrique en zone cotonnière du Cameroun. *Revue d'élevage et de médecine vétérinaire des pays tropicaux*, 64(1-4), 9-19. <https://doi.org/10.19182/remvt.10120>

Rahm, T. & Singh, R.D. (1988). Ménages agricoles en milieu rural au Burkina Faso: quelques données sur les rendements allocatifs et directs de la scolarisation et les différentiels de productivité du travail hommes-femmes. *Développement Mondial*, 16(3), 419–424.

Schumpeter J.A. (1912). *Theorie der Wirtschaftlichen Entwicklung*. Leipzig: Dunsker and Humblot

Schumpeter J.A. (1942). *Capitalism, Socialism and Democracy*. London: Allen and Unwin

Scott, G., & Griffon, D. (Eds.). (1998). *Prix, produits et acteurs: méthode pour analyser la commercialisation agricole dans les pays en développement*. KARTHALA Editions.

The Springfield Centre, (2015). Le guide opérationnel de la démarche “ faire fonctionner les marchés au bénéfice des pauvres ” (M4P), 2ème édition. Retrieved from <https://www.springfieldcentre.com/wp-content/uploads/2017/05/2017-05-SDC-Operational-Guide-for-the-M4P-Approach-2015-fr.pdf>

UNERIZ-B. (2014). Le marché institutionnel des produits du riz (Riz Paddy, Riz Blanc et riz étuvé). Retrieved from [https://roppa-afrique.org/IMG/pdf/rapport\\_etude\\_achats\\_institutionnel\\_riz\\_bkf.pdf](https://roppa-afrique.org/IMG/pdf/rapport_etude_achats_institutionnel_riz_bkf.pdf)

Williamson O.E. (1970), *Corporate Control and Business Behavior*, Englewood Cliffs. N.J.: Prentice-Hall.

Williamson O.E. (1971). The vertical integration of production: Market failure considerations. *American Economic Review*, 61, 112-23.