Inclusive business models

Empowering women in urban agriculture in Burkina Faso

Kini, J.

Publication date
2022

Citation for published version (APA):
Kini, J. (2022). *Inclusive business models: Empowering women in urban agriculture in Burkina Faso*. [Thesis, fully internal, Universiteit van Amsterdam].

Chapter 9

Contribution of the Lettuce Business to WSEs Economic Empowerment

Contribution of the Lettuce Business to WSEs Economic Empowerment[58]

9.1 Introduction

Chapter 8 showed that the groups of Tampouy and Kossodo each adopt a gender-aware inclusive business model, for the particular case of organic lettuce production and marketing, and that improvements can still be made in terms of gender equity, cooperation between actors, and infrastructure in Tanghin. This chapter continues by addressing sub-question 6: How does a gender-aware inclusive business model empower WSEs/WFEs in the urban context? It focuses on the causal analysis of the key factors that explain the contribution of these business models to the outcomes of individual women's economic empowerment, i.e., their individual functioning (material and non-material gains, see 3.1.1). The analytical framework used is a comparison of their situation before and after they started working in the women groups. The data (past and present) used here were obtained through memory recollection. Last, the chapter provides elements confirming (or not) the three hypotheses (H2, H4, and H5). Section 9.2 describes the perceived changes in women's capabilities (resources) of their participation in these businesses. Section 9.3 analyses the direct impact of the business on women's functioning on the supply side (profit, expected living conditions), and the indirect impact of their business on society (demand side).

9.2 Outcomes of lettuce business activities

This section describes the functioning generated by lettuce production as perceived by the women in this business activity themselves and by the other actors interacting with them, notably the buyers.

9.2.1 From the producers themselves

Extent of achievement

Overall, most of the producers interviewed appreciate the impact or change brought about by the business they entered into. The interviewees were asked to score their appreciation on a scale from 0 to 10. Indeed, only 11.94% (of the 42 respondents) value the impact below 5 out of 10; 35.82% appreciate it by 5, as half of their objectives have been achieved since they began carrying out this business. In addition, 50% (median) of the interviewees value the contribution of their business to their wellbeing (improvement of their living conditions) at 6 or higher (out of 10), (see Table 76b, Annex1).

---

58   Sections of this chapter were published in the article "Organic vegetables demand in urban area using a count outcome model: case study of Burkina Faso". Agricultural and Food Economics (2020) 8:22.

Time resources net change and control

The three main time usages for WSEs have been described by the percentiles' method (see Table 9.1). This shows that 25% of these women have experienced a negative change in the number of hours of sleep time, recording a decrease of 3 hours per day respectively. This means that domestic labour has not been redistributed between household's members, and the category of women are forced to reduce their sleep time. Moreover, 50% of the women have recorded a negative change of one hour less of domestic time per day. This implies that these women have less time for sleeping and for domestic work since they got involved in the lettuce business. In contrast, the 25 upper percentiles have recorded a positive change; the time available for sleeping and domestic work has increased. Besides sleeping time and domestic work time, the net change in production time is positive, even if the 25 lower percentiles (of women) have recorded no change (score 0), the 75 upper percentiles show a positive score of at least 9 hours per day (up to 12).

Table 9.1: Net change in time usage since joining a WSE group

Percentile	Net change Sleep time	Net change Production time	Net change Domestic time
p10	-8	0	-6
p25	-3	0	-3
p50	0	9	-1
p75	1	11	1
p90	2	12	4

Source: The Author, based on Fieldwork data (2018)

But overall, the business activities carried out by the women has contributed to more control of their time. Indeed, only 32.5% of the women have not recorded any change in this respect, whereas the other at least partially control their time (compared to before, when they were not a WSE's group member) (see Table 77b, Annex1).

Net change in space access

Overall, the change or impact of the business on the access to space is positive. The 0 score indicates that no change has occurred. This is the case of the 21.43% (9 out of 42) who already had access to space before their engagement in the business,

and they still have access to space. In contrast, the 78.57% who previously did not have any access to space have access now. This net impact is set at one, meaning that the change that has occurred is fully positive (see Table 78b, Annex1).

Net change in material resources

The net change with respect to material resources is positive {0;1}. A score of 0 means that there has been no change for the women, meaning they did not have material resources before and they still do not have them now, or they had access to such resources before and still have access now (26.19% for the latter case). In contrast, score 1 means that all women who did not have access to material resources before, do have access to them now (73.81% of the respondents) (see Table 79b, Annex1).

Financial resources change

The overall net change in the access to financial resources brought by the lettuce businesses is positive. Indeed, besides having full control over their financial resources, 61.90% of women who did not have access to income before, have a regular income now (score 1). No change (0 score) occurred for the other 38.10% who already had access to income and still have it now (see Table 80b, Annex1).

Change in human resources access

There is a positive net change for the women in terms of access to human capital. No change occurred for only 2.38% (one person) as they still do not have access to human capital, or they already had access to this capital and continue to have it now (score 0). However, 97.62% of those who had no access to human capital are now indeed benefiting from it; they have got from the State and other donors (see 6.3.6) many training sessions on various topics since their engagement in their groups (see Table 81b, Annex1).

Net change in relational resources

There is a positive net change in the relational aspect of the business models implemented by the women's groups on the three sites. Indeed, for 69.05% (of 42 respondents) who had no relational resources, they have been able to build such relationships through their activities (score 1). The score (0) has been attached to the 30.95% of women who either had professional relations before being engaged

in the business and can reinforce this relationship through this business model or who did not have any relation before and still do not have any professional relations now (see Table 82b, Annex1).

Net change in access to natural resources

There is a dominant zero net change in the access to natural resources between the situation before engaging in the business activities and now. Indeed, for 57.14% (of 42 interviewees) this score is zero (0), meaning that no change has occurred; they already had access to natural resources and still have access, or they had no access to natural resources and still do not have any. But 40.48% record a change, (score 1) meaning that they had no access to natural resources, and they do have access now (see Table 83b, Anex1).

9.2.2 From other actors (buyers)

The perceived change in the living conditions of women in the lettuce business from the buyers' perspective varies. Indeed, of the 230 interviewed buyers, 35.22% assert that a change has occurred in their wellbeing against 20.87% who did not see any change. 43.91% do not have any idea about this (do not know) (see Table 84b, Annex1). Furthermore, for the 81 buyers who assert the occurrence of a change in the women's wellbeing, 97.53% think this change is positive (improvement of women living conditions) (see Table 85b, Annex1). Hence, the descriptive statistics above shed light on the need to deepen the analysis in order to identify the factors that significantly explain these impacts on women's living conditions.

9.3 Impact of organic lettuce business on food entrepreneurs' wellbeing

This section aims at analysing factors determining women's profit-making behaviour as the material aspect of their wellbeing on the one hand. It also analyses the determinant factors that have allowed women to experience an overall improvement of their living conditions since their engagement in the business activities on the other hand.

9.3.1 Determinants of profit making using simultaneous quantile regression

This subsection analyses the determining factors of the distribution of profit earned by women engaged in a gender-aware inclusive business model in the case of lettuce production. It uses the quantile regression model, a non-parametric technique (see 4.7) to identify the part of the profit distribution that matters the most in a robust manner. The graph below shows the quantile distribution of profit

(here the natural logarithm-lnProfit has been used). That is, the level of profit for a given proportion of women, for example, 25% of women make profit estimated at around lnProfit = 10, equivalent to XOF 22,026 (EUR 33.58).
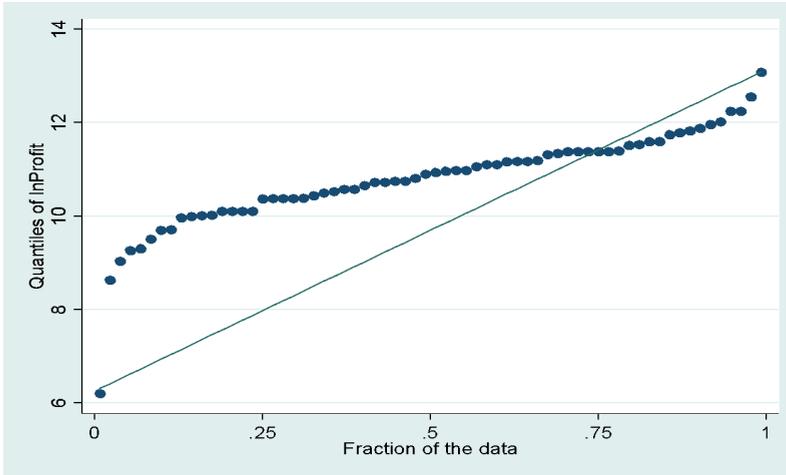
Figure 9.1: Distribution of the profit [N=42]
Source: The Author, *based on Fieldwork data (2018)*

Following figure 9.1, Table 9.2 presents the results of the profit-making determinants for WSEs implementing a GAIB model. The quantile regression model is used for this purpose, with bootstrapped standard computations (bootstrapped replications of 20[59]). Given the values of the pseudo R-squared, measuring the goodness-of-fit for each quantile, it can be concluded that the data fit the regressed model well. However, given the results, quantiles 10 to 50 hold explanatory variables with significant coefficients. Thus, they are the only ones that need to be interpreted. For the quantiles 60 to 90, none of the explanatory factors listed are significant determinants given the current conditions of knowledge.

Quantile 10

For this quantile, factors such as age, education level (formal and informal), duration (hereby considered as the years of experience women have in the business), the education squared (capacity building or know-how acquired through

_____

59   Number of times the sample (N=42) has been bootstrapped (or re-sampled) to allow the
      convergence or results obtained.

training) and the group's governance are found to be the significant determinants for making profit for the 10% of women that get less than XOF 5,592 (EUR 8.5) per year for this crop.

First, when the age of women in this group increases, it negatively influences (impacts) the amount of profit they earn (coefficient -0.043). This is understandable as only 25% of the women are less than 45 years old, and 50% are over 55 years. This means that the majority of these women are old and physically weaker to perform in this business (requiring physical strengths).

Third, the education level of the women negatively influences their profit making (coefficient -1.314), meaning that the more women in this distribution are educated, the less profit they make. This result can be seen as a paradox as the inverse was most expected. However, this result can be understood as 75% of these women are not educated (formal nor informal). Only 5% have reached secondary school, and 10% have at least had access to non-formal and/or formal education. This result tends to indicate that the lettuce business is more beneficial to non-educated women, as all women in this quantile are non-educated.

The education squared (i.e., human capital or know-how acquired over the years) positively influences the profit distribution for this quantile (coefficient 0.443), meaning that the more women in this quantile get access to training related to their business activities, the more profit they make. This result is interesting as it shows the importance of capacities or capabilities reinforcement when conducting this type of business. Indeed, most often, these trainings are designed to respond to specific (technical) needs of women in food production and marketing (here: organic techniques, collective marketing system). Trainings of this kind are very practical and based on the local knowledge (WFE Project report, 2018) which implies that they are internalized by women, increasing therefore their capabilities (agency and capacities).

The duration (or experience) of this proportion of women in the business positively affects the distribution of the profit at this quantile (coefficient 0.501), meaning that women with more experience or who are in the business for a long time, make more profit than the newcomers. This result is logical as the experience in this field can be analogous to "learning by doing" in the theory of endogenous growth (see chapter 10). The idea is that in the beginning, women did not master the set of opportunities and threats as well as the weaknesses in the business. However, as time goes by, they learn more from the realities they face on a daily basis, and they integrate these lessons into their behaviour.

In contrast, for these women, their group's governance has a negative influence on their profit at the quantile level (coefficient -0.534). This result is interesting as it shows that some of the women consider the governance of their group as hindering their effort to make profit. Probably, this can be understood by the fact that some women find the governance not good. The reason is that the women consider the cost or money they have to pay per plot of land and for water use too high, and they complain that they do not see the destination nor the benefit of this money. The payment of these fees is mandatory, it therefore impacts the gains. In other words, a well governed group is costly for this group of women as it reduces their profit making.

Quantile 20

For the quantile 20 (moving from 10 to 20), a change can be observed in the factors that explain the distribution of the profit. Indeed, age and education are no longer significant explanatory variables of this distribution. However, human capital (educ2) is still significant (0.257) and positively influences the profit made by women in this quantile. In addition, the duration of women at the site (0.416) still positively influences the profit making for this proportion of women; whereas the group governance still negatively influences this distribution (-0.572). Overall, the change in the distribution of the profit has resulted in a reduction of the number of determinant factors, as well as the value of the coefficients or power of these factors.

Quantile 30

For the quantile 30, factors such as age, duration and group governance continue to be significant factors influencing this distribution of profit with their respective coefficients -0.022; 0.469 and -0.484. Their individual effect on profit making is similar to what is seen in the previous quantile, except for their power. Furthermore, for the factor age, the effect is more powerful than it is in the quantile 10 (-0.043 < -0.022). In addition, the effect of duration is more powerful than in quantile 20 and less than in quantile 10 (0.416 < 0.469 < 0.501). Finally, group governance has a larger effect on this profit distribution than in the first and second quantiles (-0.572 < -0.534 < -0.484).

Quantile 40

In the quantile 40, the household size of women in the lettuce business and their duration in the business prove to be significant factors affecting this distribution of the profit. First, the household size positively influences the profit with a power of 0.050. This is because the family size is an incentive for women to work more and earn

more income to support the household. Second, the duration positively influences the profit making for this proportion of women with a coefficient of 0.493. As the duration is also understood as experience (held by women over years), it increases the profit made at this quantile. Overall, from quantile 30 to 40, there is a reduction in the number of significant factors influencing women profit making. Indeed, there is a new entry significant factor (household size), whereas age and group governance are no longer significant (dropped out).

Quantile 50

In the quantile 50, only the factor related to the number of meals per day in women's household is a significant factor of profit making for this proportion of women. Indeed, the number of meals eaten by adult people positively influences the women's profit making, whereas the number of meals eaten by children in the household negatively influences the profit earned by women. The first case is easy to understand, as food is an important part of women's physical strength and ability to work (grow food and other income generating activities), no one can work being hungry. In the second case, the number of meals per child per day can be seen as a charge for the women. As they need to feed their children, they usually spend all or an significant part of their income on food, and they are not able (or prevented) to reinvest in their activities to generate more income, whereas investing and reinvesting in a business are seen are key elements for this business to grow.

Both cases show that the majority of these 50% of women (earning less than XOF 46,518 (EUR 70.92) in a year) working in the lettuce business can be considered as necessity entrepreneurs as most the determinant factors of their profit earning are related to food security (assurance), and are not oriented toward investment or reinvestment in their business for growth.

Hence, social and time factors such as age, education, human capital, household size, duration, group governance (somewhat economic) as well as the food related (food instance) or food security matters are the key determinants of the distribution of the profits earned by women producing lettuce (business models).

Table 9.2: Quantile regression of the profit making in lettuce business

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Age	-.043**	-.022	-.022*	-.022	-.013	-.002	.003	-.013	-.013
	(.017)	(.016)	(.011)	(.017)	(.021)	(.020)	(.013)	(.024)	(.027)
Marital Stat	-.281	-.484	-.364	-.358	-.072	-.093	.110	-.197	-.178
	(.250)	(.325)	(.335)	(.414)	(.446)	(.535)	(.471)	(.542)	(.484)
Education	-1.314*	-.500	-.410	-.330	-.391	-.302	-.483	-.519	-.557
	(.678)	(.639)	(.510)	(.617)	(.598)	(.510)	(.373)	(.733)	(.348)
Size	.002	.050	.050	.050*	.028	.006	.017	.028	.054
	(.054)	(.042)	(037)	(.027)	(.034)	(.036)	(.030)	(.052)	(.059)
Meal adult	.004	.111	.108	.246	.642**	.238	-.086	-.183	-.293
	(.491)	(.350)	(.345)	(.381)	(.305)	(.392)	(.313)	(.584)	(.453)
Meal Child	.005	-.221	-.338	-.422	-.523	-.129	.105	.328	.349
	(.576)	(.445)	(.331)	(.386)	(.294)*	(.425)	(.445)	(.804)	(.506)
Duration	.501**	.416*	.469**	.493*	.328	.190	.252	.313	.352
	(.238)	(.242)	(.194)	(.265)	(.214)	(.276)	(.198)	(.289)	(.233)
Educ2	.443*	.257*	.216	.183	.159	.095	.132	.219	.212
	(.248)	(.233)	(.177)	(.215)	(.195)	(.179)	(.164)	(.256)	(.140)
Govern	-.534**	-.572***	-.484*	-.434	-.351	-.220	-.077	.072	.117
	(.263)	(.153)	(.284)	(.293)	(.287)	(.223)	(.156)	(.149)	(.193)
Constant	10.84***	10.97***	10.57***	10.34***	10.14***	10.48***	9.190***	9.79***	9.42
	(2.134)	(2.515)	(2.360)	(2.163)	(2.664)	(2.472)	(1.990)	(3.116)	(3.40)***
Pseudo-R2	0.2202	0.2173	0.2107	0.1791	0.1416	0.0990	0.0878	0.1273	0.2006

*** Significant at 1%; ** Significant at 5%; * Significant at 10%; Obs: 44. *Source: The Author,*

9.3.2 Determinants of perceived impact of the business model on women's lives

This subsection aims at assessing the self-perceived impact of the lettuce business model on women's individual functioning. For this purpose, a quantile regression model was used to analyse the perceived impact for the main quantiles (25, 50 and 75) regarding the net change in the access to the different resources (see. 9.1.1). Figure 9.2 shows the distribution of the perceived impact of the business on women's wellbeing.

Figure 9.2: Distribution of the Extent of achievement
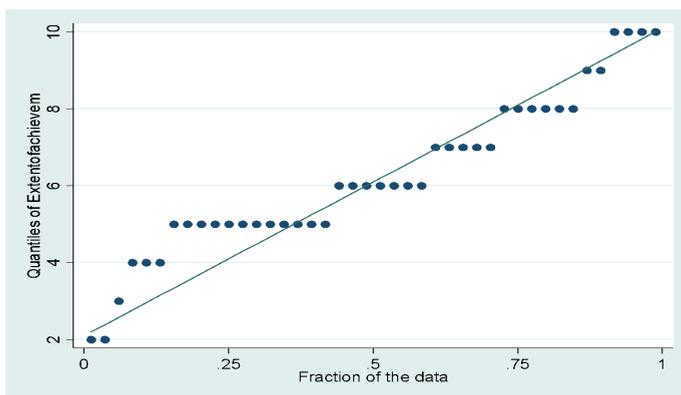
Source: The Author

Table 9.3 below presents the results of the quantile regression model. Overall, the value of the Pseudo R-squared per quantile informs us that the model fits well with the data used. It shows that there is no significant factor explaining the impact of lettuce business on the wellbeing of women in this quantile 25 (25%). Therefore, only quantile 50 and 75 will be interpreted.

Quantile 50

For the quantile 50, or the median, only the net changes in the time for production and human capital appear to be key significant determinants of the contribution of lettuce production to the wellbeing of the women in this quantile. Indeed, the production time was found to be negatively influencing the perceived impact of the lettuce business (coefficient -0.2211). But the net change in human capital positively contributes to the perceived impact of this business on women's wellbeing.

Quantile 75

For the quantile 75, net changes in production time, domestic time and human capital each have a significant effect on women's wellbeing. Their coefficients are respectively -0.2531; 0.3924 and 5.8861 (see Table 9.1). In other words, the net change in production time (mostly positive change), negatively impacts the women's wellbeing; whereas the net change in domestic work time (mostly negative change) positively impacts women's wellbeing.

Analytically, as domestic work is mostly carried out by women who did not have income generating activities prior to their lettuce business, the overall net time for domestic work has decreased for some and remained unchanged for others. Indeed, women situated at the upper 75 percentile have not observed a reduction of their time for domestic work. In other words, 75% of women have a negative net time change meaning that their time dedicated to household work has decreased. This probably explains why the overall effect of the reduction in domestic time positively contributes to improving their wellbeing. This sounds as a good result, because it shows that gender-aware inclusive business contributes to decreasing the time spent on domestic work. As seen earlier, domestic work is a gender barrier (unpaid activities) that prevents women from engaging in business as well as performing or sustaining their business (Pouw, 2017; Marlow & Dy, 2017).

In contrast, the net change in production time (overall positive as only 25 women have observed no change in their time dedicated to work both for the production activities and other income generating activities) affects the perceived impact of the business

on their life to a greater extent (in absolute value) when moving from quantile 50 to quantile 75. This means that when the time dedicated to production increases, women's perceived gains (material and non-material) seem to be less significant than the endeavour they put in the business. This result is understandable as most of the women who carry out the business spend most of their time on production. As in this research, the production time is measured as the time spent at the production site (which includes moments of rest, food breaks, as well as moments of water shortages which implies that they have to wait at the site). In other words, the production time is seen as the time spent by women in their work environment (or place), which is usually different from the effective time dedicated to the activities.

Moreover, human capital is a key determinant of the perceived impact on women wellbeing since they are involved in the business. Indeed, for both quantiles 50 and 75, when women's human capital increases (positive change), it significantly and heavily contributes to increasing the perceived impact on their wellbeing (4.2110 and 5.8861 are the coefficients respectively for quantile 50 and 75). The effect is greater for quantile 75 compared to quantile 50, meaning that the trainings and capability reinforcements the women have benefitted from in this business seem to have a great influence on their material and non-material gains (income, food security and so on). As previously seen, human capital plays the same role as education squared does for the profit making (see 9.2.1).

Thus, the positive change or increase in production time reduces the perceived impact of the business on women's wellbeing (living conditions). This can be due to the fact that despite the important time they dedicate to their business activities, most of them do not see or earn significant profit that can drastically change their life in a material or non-material way. Second, the reduction in domestic work time (negative change) has a positive impact on the wellbeing of women producing lettuce. This can be seen as the gender-sensitive side of the business: domestic work due to culture, and customs are the tasks of women in the household; often preventing them from carrying out income-generating activities. Third, the set of training sessions attended (on crops vending strategies, organic food growing techniques, buyer reception and so on) and other capacity reinforcement gained by women since they have been active in this business, is the most important factor contributing to their material and non-material wellbeing. This is an important finding as gender-aware inclusive business theory is therefore consistent (aligns) with the theory of human capital (see chapter 10).

Despite the fact that the relational net change of the lettuce business model appears not to be statistically significant on the perceived impact on wellbeing through the quantile regression, it is still an interesting aspect of the research findings. Indeed, the narratives and descriptive data retrieved from the interviews (see 7.3.3) show that 76.12% of the women attest to having experienced an improvement in the social relations within their groups, with their buyers and partners, and within their household.

Table 9.3: Main quantiles regression used for impact analysis

	0.25	0.5	0.75
Production time	4.15e-17	-.2211*	-.2531**
	(.1533)	(.1242)	(.1065)
Domestic time	-1.72e-16	.3467	.3924***
	(.2872)	(.2153)	(.1428)
Space	-1.0000	1.1758	.2405
	(2.1155	(1.1831)	(2.0856)
Material	-1.58e-15	-.3216	-.5189
	(2.7563)	(1.8951)	(2.8064)
Financial	1.47e-15	-.4321	.2151
	(2.7563)	(1.3469)	(2.1310)
Human	2.000	4.2110***	5.8861***
	(1.9114)	(1.0746)	(2.0873)
Relational	1.0000	-.0101	.3291
	(1.2292)	(1.2126)	(1.3399)
Natural	1.21e-16	.2261	.8607
	(.8137)	(.7438)	(.8864)
Constant	3.000*	3.3768***	2.8481**
	(1.2314)	(1.1708)	(1.2117)
Pseudo-R2	**0.1075**	**0.1654**	**0.1584**

*** Significant at 1%; ** Significant at 5%; * Significant at 10%; Obs: 41

Source: The Author

9.3.3 *Effect of gender-aware inclusive business models on the community wellbeing: analysing the demand-side outcomes of the business*

This section analyses the demand side of the gender-aware inclusive business model (lettuce production). It aims at capturing the social benefits offered by their activities to their communities or society as a whole (Ouagadougou). As such, the key determinants of the demand can be seen as the interaction between WSEs and their buyers (comprising some of the technical partners, end-consumers and retailers). This section is deeply anchored in the work by Kini, Pouw and Gupta (2020), which focused on the interactional aspects of the demand.

Determinants of the demand using the negative binomial regression model.

Based on the model used by Kini, Pouw & Gupta (2020), Table 9.4 presents the results of the negative binomial regression model given the dataset described above. It shows that the coefficients of the variables distance, utilisation, quality, duration, governance and income are statistically significant, and they are therefore the key determinants of the demand for organic lettuce at the production site.

First, the distance travelled by buyers to the production sites negatively influences their demand to buy the food over there. The larger the distance is, the less buyers are willing to travel to the sites to buy the food. This can be seen as logical since economic agents who are supposed to be rational see high transaction costs in a longer travel distance to get such food. As such, this result supports the transaction costs theory within the broad paradigm of institutional economics (Williamson, 1989) and may explain why "more than 78% of consumers in the sample live between 0.01 and 5 kilometres (in a round trip)" (Kini et al., 2020, p.12). However,

> *as the distance is an interest variable, it is worth paying attention to the motivations of the 9% of consumers who travel between 10 to 60 kilometres to purchase organic food at the production sites. Indeed, among those 19 consumers who live at this distance, 4 come weekly to the production site to buy organic vegetables. The main reason they give is the healthy attributes of such food as well as the clean water used to water the crops and the hygiene surrounding the production process. That is, those consumers are not guided by the price or the costs related to their displacement to the site, but the intrinsic or real value that they attach to those sites. Compared to the other consumers that perceive the same attributes in such food, we can deduce that the attachment of the former to the site activities is greater when considering the effort they put in the process. From an anthropological perspective, the behaviour of consumers who live far from the production sites is not irrational, but socially valuable as they have integrated several social considerations into their behaviour that contribute to social and environmental sustainability, and their own wellbeing (health)* (Kini et al., 2020).

Second, the utilisation or destination (end-consumption or retailing) of the purchased food on the marketplace negatively influences the demand for this food. In other words, when seeing a buyer at the production site, there is a great probability that the purpose of buying the vegetables is for their household consumption. This result explains why "more than 98% of the buyers of such food are direct consumers, and not resellers or intermediaries in Ouagadougou" (Kini et al., 2020, p.13). This can show

the importance for consumers of being aware of control the quality and traceability of the food they eat. In such a way, the evidence confirms the theoretical understanding of the demand for a good under the short value chain theory (Marsden et al., 2000).

Third, the perceived quality of the food purchased at the sites positively influences the demand (frequency) for this food by consumers. The demand at the site increases when the quality of the food is considered to be good (good appreciation). In particular, as this food is organic, which implies being a healthy consumption, the buyers are attached to this attribute. Indeed, the health awareness of consumers significantly increases the probability for them to frequently buy organic vegetables at the production sites. In other words, consumers who care more about the healthy attributes of food for consumption are more likely to be motivated to frequently buy organic food at their production sites (Kini et al., 2020).

Fourth, the duration or the number of years buyers have been regularly frequenting the production sites to purchase lettuce (food), positively influences the demand for this food. Indeed, the demand increases when the buyers have the habit of coming to the site for years. This is probably due to the fact that over the years, there is a certain confidence created, both in the quality of the products as well as the social relationships that have been built between the women groups and their buyers.

Fifth, the group governance appears to be negatively influencing the demand for lettuce. The results show that when the perceived group governance by buyers improves, it decreases the demand for this crop at the site. This result can be seen as a paradox. Indeed, as seen in chapter 5, the group governance is related to the internal organisation of the members: production, marketing, and leadership. Except some problems related to the leadership highlighted by certain group members, the collective selling system in Kossodo and the similar one in Tampouy are found to be very much appreciated both by buyers and by the producers themselves. The explanation that can be given to the negative relation between the perceived governance of the group and the demand at the site is probably and indirectly linked to the price and/or quantity of the product. Indeed, in these groups, membership fees (500 per planch and per month) as well as water access fees to water the crops do somehow impact the quantity and price of demand. Thus, certain consumers may be reluctant to consume by reducing the frequency or the quantities; and they just buy the minimum necessary and they frequent the site as little as possible. In addition, due to the rigour in the governance of certain groups, particularly Kossodo, many buyers find that the group leader is quite severe; and that few women are seen as not very respectful to the buyers. As such, this can discourage those buyers to buy the food at the site, thus reducing their visits to the site and their demand of the food.

Finally, buyers' income is positively linked to the demand for the food (lettuce) at the production site. This means that buyers increase their demand (frequency in purchasing) for lettuce when their income increases. In other words, buyers with higher income are the most likely to frequently go to the production site to buy lettuce. As such, the current result contrasts with Kini et al. (2020), but verifies the traditional theory of the demand, particularly for normal goods, stating that when people's income increases, their demand for certain types of good (here organic food) also increases, in other words, that wealthier people tend to consume more of the organic food (see chapter 10).

In conclusion, the results identify additional explanatory factors to the demand for lettuce: The experience or duration in buying the food and the income of buyers are favourable determinants of the demand; but the group governance is seen to be a hostile factor that reduces buyer's visits (and hence demand) to the production sites where the lettuce is grown.

Table 9.4: Negative Binomial Regression Model

Frequency	Coefficient	z	P>|z|
Distance	-.034***	-2.65	0.008
Utilisation	-1.243***	-3.71	0.000
Quality	.233*	1.65	0.099
Remarks	.066	0.43	0.667
Marital	-.265	-1.63	0.102
Education	.049	0.85	0.393
Size	-.018	-0.71	0.475
Duration	.027*	1.84	0.066
Governance	-.346**	-2.03	0.042
Income	.326***	3.03	0.002
Constant	.423	0.30	0.761

Obs:139
LR chi2(10) = 41.80; Prob > chi2= 0.000
Log likelihood (non-restricted) = -756.282
Log likelihood (restricted) = -441.289
LR test of alpha=0: chibar2(01) = 385.67; Prob >= chibar2 = 0.000
Level of significance: *** (1%); ** (5%); * (10%)

*** Significant at 1%; ** Significant at 5%; * Significant at 10%;

Source: The Author

Analysis of the demand: value of the purchased crops

This subsection identifies and analyses the key determinants of the demand for organic lettuce. For this purpose, a linear regression model was run with the data collected from the consumers. Given the statistic F (2.30) and its p-value (0.0113), the model is overall adequate as the included explanatory variables (data) fit well with the model (at 5%).

Overall, five explanatory variables were identified to have a statistically significant effect on the purchased value of lettuce at the production sites. These are: utilisation/destination (-1.24), feedback made by buyers to the producers (-.446), knowledge/information on the business activity (production, consumption and managerial) that buyers share with women food producers (0.599), the buyers household size (-0.046) and the perceived governance of the group (0.357).

First, the destination of the purchased food is negatively linked to the purchased value, meaning that when the buyer is an end-consumer, the value of the purchase decreases. The value increases when the buyer is a retailer. As seen previously in the chapter 6, retailers are somehow preferable buyers of women in this business activity because retailers purchase a greater quantity of lettuce than end-consumers do. With retailers, women gain by rapidly selling their food, but not the premium price). In contrast, they get a higher price selling to end-consumers, but end-consumers buy smaller quantities (see chapter 6).

Second, when buyers make some feedback such as discussing the price (or quantity sold) or on how women food producers behave (including the way producers receive the buyers at the sites), this contributes to reducing the value of the demand for lettuce. It is a habit of consumers, particularly in Ouagadougou, to discuss or negotiate the prices or quantities of goods in order to get a better price for a larger quantity. This is also accurate for retailers who want to make a profit when reselling the food at the marketplaces, and they need to purchase the food at a lower price or larger quantities for a given amount of money they have. This result is an important part of the interacting variables identified as central in the short value chain perspective (Kini et al., 2020).

Third, sharing the knowledge held by purchasers with food producers at the site appears to be significantly and positively influencing the demand for lettuce produced by women implementing this business model. In other words, the more women receive knowledge or information, suggestions or recommendations from their buyers in relation to their business process (production techniques, marketing

techniques/ strategies), the more the value of the demand increases. This finding is accurate in the sense that many consumers of lettuce stop going to the sites to buy it over the period of low production (non-production) of lettuce. Indeed, there are periods in the year, such as April up to September, when lettuce production slows down at these sites, many buyers that are only interested in this particular food product stop coming. Since buyers share their knowledge and suggestions with women, if the latter take into account this knowledge by applying these recommendations, they would be able to expand or extend the production period; and consequently, reduce the lettuce shortages at the sites. Therefore, buyers can continue coming to the sites to purchase the crop.

However, for a buyer to share his or her knowledge with producers, there is a threshold of confidence or mutual interest in a durable relationship between both types of stakeholders in this value chain. This shows that there are buyers who are more engaged in the social relationships with the women's group, something that is beyond the rules of a perfect and pure market, which assume that every buyer is seeking to minimise the cost of purchases. Indeed, by spending their time to share their knowledge with women producers, there is an opportunity cost of this time that has been spent socially that will probably not be included as discount on their purchase value. Thus, the buyers express how important the sites are, as well as the business activities and the women themselves. This finding also expresses how the social environment (community or society) of the business that women carry out is willing or available to help them sustain these types of activities with many social and economic benefits to the community.

Fourth, the size of the buyers' household appears to be negatively linked to the demand for lettuce in Ouagadougou. This means that when the size of the household increases (more members), there is a tendency for the household to reduce the demand for this food product. In other words, families that need to feed many people tend to demand less organic lettuce. As this food is of great quality, the price can be somewhat higher for certain households, including those of larger sizes that are likely to live under the poverty line.

 Fifth, the group governance appears to be positively linked to the demand (in value) for lettuce at the production sites. As such, when the governance improves, the value of the demand for lettuce increases. This result can be seen as the opposite of the one found in the previous analysis, using the negative binomial model. However, it makes sense because, as stated above, a group well governed assumes that the internal organisation leads to relatively higher cost supported by each woman individual: fees for water, for gatekeeper salary and contribution for

each trench under cultivation and per month as membership fees. This increase in the production cost is directly transferred to the selling price, and then increases the value of the purchased lettuce. In contrast, it reduces the frequency of buyers at the site as seen in the previous subsection.

Hence, the linear regression model, which was used to analyse the value of the purchased lettuce at the production sites, has identified some new key explanatory variables. Particularly, the interactive variables such as feedback and knowledge or information sharing by buyers. This highlights the social and relational benefits related to this business model as the stakeholders interact, exchange ideas to sustain the business, and share which products or services are very well appreciated by the whole community women live in. This is easier to understand since most buyers are end-consumers, and the final destination (market or end-consumer) negatively affects the quantities of food purchased. In addition, the family size of the buyers is a factor to pay attention to, as it negatively affects the demand for organic food in Ouagadougou. The organisational variable (governance) is favourable to the purchase value at the site.

**Table 9.5: Linear Regression Model for demand analysis**

Value	Coefficient	t	P>|t|
Distance	.005	0.35	0.730
Utilisation	-1.24***	-2.95	0.004
Quality	-.080	-0.48	0.631
Remarks	-.446**	-2.57	0.011
Knowledge Sharing	.599**	2.01	0.046
Gender	.285	1.24	0.217
Age	.002	0.31	0.758
Size	-.046*	-1.83	0.070
Duration	.015	0.85	0.398
Income	.081	0.69	0.491
Frequency	.002	0.26	0.794
Governance	.357*	1.90	0.060
Constant	5.328***	3.44	0.001
F = 2.30; Prob > F = 0.0113			

*** Significant at 1%; ** Significant at 5%; * Significant at 10%;
Source: The author

Quantile analysis of the demand value

This subsection complements the previous analysis on the amount of the purchased food. It uses the quantile regression model to analyse the influence of the explanatory variables on the distribution of the demand value. The simultaneous quantile regression is used under Stata 15 for this purpose (see. Table 22). The Figure 9.3 below shows the distribution of the demand value.
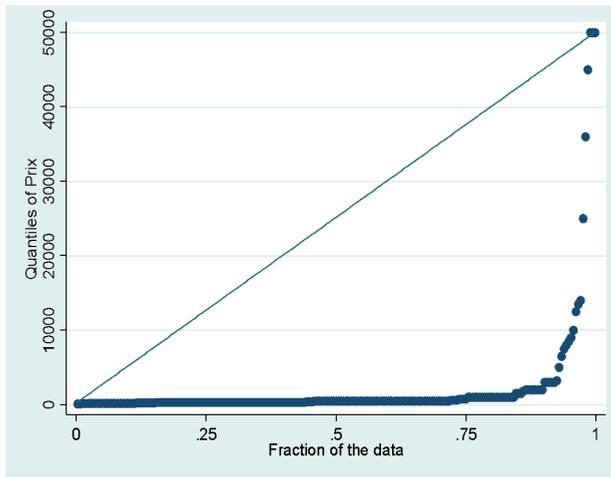
Figure 9.3: Distribution of demand value
Source: The Author

The results show no significant factors explaining the quantiles 10, 20 and 30, except the constants. However, the regressions for the quantiles 40 to 90 show various statistically significant explanatory factors. In addition, overall, the regressed models fit well with the data in regard to the Pseudo R-squared values.

First, in the quantile 40 regression results, variables such as the use of the purchased lettuce and feedback made by buyers to producers are significant (coefficients respectively -1.459 and -0.267). This means that the final destination or use of the purchased food negatively influences the distribution of the demand value at this quantile level. The more feedback that are made to food producers, the less it affects the demand value at this quantile level. These results are consistent with the previous findings in the case of the linear regression model, and show that for a proportion of buyers, their demand behaviour is more sensitive to the final utilisation of the product, and their capacity to discuss or negotiate the price or quantity.

Second, for the quantile 50 (50% of buyers who buy less than XOF 500 per round-trip), only the variable feedback to the producers is significant with a coefficient of -0.377, lower (but higher in absolute value) than it was in the quantile 40. As such, the more feedback that are made to producers, the more the quantities demanded decrease for this particular category of buyers. Consequently, when the distribution of the demand value changes from 40 to 50%, the effect of this change is heavier as the coefficient becomes low: -0.377 <-0.267. This finding still supports the previous one, as negotiating the quantity or price leads to reducing the value of the demand.

Third, in the quantile 60, two factors appear to have a significant effect on the demand value. There is the feedback made to the producers and the size of buyers' households with their respective coefficients -0.471 and -0.056. Both variables negatively affect the demand value for lettuce for the 60% of buyers who buy a little bit more than 500 FCFA. However, the effect of the feedback to producer is lower in the quantile 60 than the quantile 50 in regard to their coefficients: -0.471 < -0.377. At this quantile level, buyers' household size comes into play by supporting the previous finding with the linear regression model. The feedback made by buyers to the producers is also consistent with these previous findings.

Fourth, in the quantile 70 regression results, three factors appear to be significantly influencing the distribution of the demand value, such as feedback to producers, marital status and household size with their respective coefficients: -0.625, -0.707 and -0.057. They all have a negative effect on the demand value for this proportion of buyers. Indeed, the feedback made to the producers still reduce the demand value (see the previous subsection). However, the impact of this is lower for this quantile than for the previous two quantiles, since their coefficients are classified as follows: -0.625 <-0.471 < -0.377 <-0.267. This means that, for this quantile, the effect of feedback is heavier on demand value (reducing more importantly) than in the previous quantiles.

The marital status of the buyers also reduces the value of the demand for lettuce. Indeed, a single buyer is more likely to demand for lettuce than a widow or married buyer and vice-versa. This holds because most of the buyers are end-consumers. An explanation of this result may lie in the fact that widows and married buyers are more likely to have more people to feed, which implies a relatively important household size. As previously seen, the household size reduces the demand value for lettuce. In that vein, the other factor negatively influencing the demand value for lettuce is the buyers' household size. The impact of this household size on the demand value for the quantile 70 is almost equal to its effect on the quantile 60 (respectively -.057 < -.056).

Fifth, for the quantile 80, the distance travelled to the production site, feedback made to the producers, the buyers' gender and their marital status are found to be the significant explanatory factors for the 80% of the purchasers buying more than XOF 750 (EUR 1.1) per round trip. The distance travelled appears to be positively linked to the demand value (coefficient 0.026), meaning that the longer the buyer travels to the site, the more likely the demand value increases. This is understandable as a buyer who travels a long distance tends to buy larger quantities per round-trip. If the buyer is an end-consumer, the behaviour can be explained by his or her intention to use these crops many times (certain quantity per day) before going back to sites. He or she could be led by the will of saving their spending in terms of financial and time resources. If the buyer is a retailer who travels a long distance, he or she tends to buy more of the lettuce to avoid many roundtrips per day, as it will not be cost-efficient for him or her. We should note that the resellers behave as in a pure or perfect market.

Feedback made by buyer is still a significant factor that negatively influences the demand value of lettuce (see previous quantiles). However, the impact is greater (higher reduction) for the quantile 80 than the previous other as: -0.808 < -0.625 < -0.471 < -0.377 < -0.267. Furthermore, buyer's gender negatively influences the demand value of lettuce (coefficient 0.590). This means that a female buyer is more likely to purchase with a lower value the lettuce than a male buyer. This is attested by women producers themselves in chapter 6, as female buyers are more likely to discuss or negotiate the price or quantity in order to get some reduction (discount) than male buyers who are recognised not to complain about prices nor quantities.

Sixth, in the quantile 90, the distance travelled to the sites, the utilisation (use) of the purchased food, the feedback made by buyers, the marital status of buyers and the size of their households are the key determinants of the demand value particularly for the 90% of purchasers buying less than XOF 3000 (EUR 4.6). Except for the utilisation of the food, which is a new and significant factor, the remaining factors connected to the demand value have already been presented in the analyses of the previous quantiles. Distance still has the same impact (influence on the demand) with the coefficient 0.026. The feedbacks by buyers also still have a negative influence, but the impact is higher in absolute terms than in previous quantiles (40, 50, 60 and 70), and lower in absolute value than in the quantile 80. In addition, the utilisation of the purchased lettuce negatively influences the demand value for 90% of the buyers (buying less than XOF 3000). In this category (quantile 90), end-consumers are less likely to demand for food up to this level, except buyers for social events such as weddings, or baptisms for example. In contrast, if the buyers are retailers, they are likely to purchase a lot, hence a high value of demand.

Hence, different quantiles are determined by different sets of explanatory factors that differently affect the demand for lettuce. The most common factor to all these quantiles (except quantiles 10, 20 and 30) is the feedback made by buyers to the producers. The results show that the feedback is a key factor that decreases the demand for lettuce (in value). The extent of its influence increases when moving from the lower quantiles towards the higher one, with an exception for the quantile 80 that records the highest impact of the feedbacks by buyers. The utilisation of lettuce, the distance travelled by buyers, the gender of buyers and the size of their households appear to be significant factors to the demand from the quantile 60 onwards.

Table 9.6: Simultaneous quantile regression of the demand (value/amount)

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Distance	-.006	.006	-.007	.002	.013	.015	.024	.026*	.026*
	(.016)	(.016)	(.017)	(.018)	(.018)	(.015)	(.016)	(.014)	(.0136)
Use	-.934	-.802	-.884	-1.459*	-1.331	-1.390	-1.221	-1.093	-2.621**
	(.572)	(.569)	(.685)	(.743)	(.831)	(.919)	(1.065)	(1.254)	(1.254)
Health	.225	.067	-.013	.010	.058	-.038	.047	.059	-.626
	(.241)	(.189)	(.155)	(.175)	(.191)	(.222)	(.291)	(.393)	(.609)
Remark	-.164	-.216	-.105	-.267*	-.377**	-.471***	-.625***	-.808***	-.703**
	(.151)	(.132)	(.140)	(.139)	(.157)	(.172)	(.191)	(.239)	(.300)
Knowledge	.296	.131	.364	.325	.289	.303	.343	.370	.552
	(.286)	(.318)	(.373)	(.363)	(.396)	(.459)	(.467)	(.452)	(.577)
Gender	.056	.268	.077	-.302	-.134	.147	.132	.590*	.667
	(.316)	(.343)	(.357)	(.390)	(.357)	(.315)	(.321)	(.341)	(.463)
Age	-.002	-.002	.003	.004	.009	.011	.013	.021	.032
	(.009)	(.008)	(.008)	(.009)	(.008)	(.011)	(.013)	(.014)	(.019)
Marital	-.117	-.003	-.141	-.240	-.422	-.416	-.707**	-.881**	-1.195**
	(.213)	(.242)	(.245)	(.258)	(.271)	(.323)	(.322)	(.364)	(.564)
Education	-.032	.031	-.001	-.019	-.032	-.009	-.008	.007	-.012
	(.077)	(.073)	(.071)	(.060)	(.051)	(.055)	(.066)	(.082)	(.205)
Size	-.008	-.009	-.019	-.035	-.033	-.056**	-.057**	-.054	-.108**
	(.022)	(.022)	(.022)	(.026)	(.029)	(.027)	(.024)	(.035)	(.050)
Frequency	-.018	-.010	-.021	-.020	-.019	-.023	-.023	-.008	-.003
	(.017)	(.0158)	(.016)	(.017)	(.015)	(.014)	(.017)	(.018)	(.027)
Duration	-.003	.006	-.004	.008	.005	.016	.024	.026	.053
	(.018)	(.017)	(.018)	(.018)	(.023)	(.026)	(.027)	(.027)	(.034)
Cost	.151	.057	.164	.138	.139	.119	.105	-.067	-.259
	(.127)	(.122)	(.119)	(.128)	(.123)	(.141)	(.175)	(.209)	(.246)
Income	-.045	.007	.044	.211	.183	.162	.040	-.220	-.080
	(.160)	(.129)	(.137)	(.143)	(.135)	(.140)	(.160)	(.189)	(.340)
Constant	6.037***	5.702***	5.117***	4.498**	4.641**	5.052**	6.699***	10.67***	12.79***
	(1.933)	(1.595)	(1.697)	(1.777)	(2.058)	(2.083)	(2.511)	(2.896)	(4.153)
Pseudo-R2	0.1076	0.0903	0.0535	0.0976	0.1576	0.1405	0.1749	0.2128	0.2809

*** Significant at 1%; ** Significant at 5%; * Significant at 10%

Source: The Author

To conclude, many determining factors of the demand for organic food have been identified, and more detailed attention needs to be paid to the perspective of political implications.

9.4 Conclusion

Overall, a gender-aware inclusive business model contributes to WSEs' economic empowerment in Ouagadougou by bringing changes in their capabilities or resources, which in turn improves their functioning (material and non-material gains). Indeed, all resources such as time, space, material, human capital, natural and relations improved due to business carried out by women. This finding confirms the empowerment process introduced by Riisgaard et al. (2010). The result also confirms the *(H2)* as the gender-aware inclusive business model that is innovative, credible, affordable, adaptable and viable has brought about these changes in WSE's individual capabilities.

On the one hand, GAIB directly improves WSE's expected living conditions, which comprise both material and non-material expectations (for a valued life) from their participation in the business. While all the capabilities (resources) of each woman have increased, the econometric modelling reveals that the most significant capabilities that cause these changes in the women's living conditions comprise the human capital and time resources. Indeed, human capital and the time resources are clearly the key channels through which a gender-aware inclusive business can lead to women economic empowerment. For example, the time resource is important, because they can shift from domestic (unpaid) work to paid work, which implies that they gain control of their time. Nevertheless, other WSEs have their time burden increased because of their business activities. In addition, the human capital highly contributes to increasing the material gains of these women, which is also part of their economic empowerment. Consequently, this confirms the hypothesis *(H4)* stating that "At least one change in resources or capabilities significantly determines WSE's functioning or expected living conditions from their business".

In particular, several socio-demographic and economic characteristics of WSEs are key determining factors of their profit-making behaviour. Indeed, the econometric modelling of profit-making shows that WSE's age, education, know-how (capacity building), experience, household size, duration in their group, their group governance and food security matters are the key factors explaining women's level of profit. This finding confirms the hypothesis *(H5)* stating that at least one socio-demographic and economic characteristic of WSEs is a significant factor determining their functioning (material gains) due to their business.

On the other hand, gender-aware inclusive business models are socially beneficial as they provide quality food to the urban community. Such a social benefit is also part of WSEs' non-material gains. Thus, the analysis of the demand for WFSE's food products reveals interesting social aspects such as the interactions between women producers and their buyers. These interacting factors, such as feedbacks or negotiations on the prices or quantities as well as knowledge and information sharing, are important proof for the value of these businesses in the eyes of the society. Consequently, this type of business is economically and socially adequate for women in poor conditions to sustainably improve their living conditions (materially and non-materially). Chapter 10 elaborates on the political implications of these findings, in regard to the sustainable development goals.