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# CONSUMER'S UTILITY CHANGES FROM RURAL EXODUS IN CAMEROON

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**Using a Computable General Equilibrium (CGE) model of Cameroon, this paper assesses the demand for the locally manufactured goods and their imported imperfect substitutes as large number of people migrates from villages to cities. The urban consumer's utility is measured through an Armington utility function which evaluates the changes or substitution between locally manufactured and imported goods of each sector. Three cases arise from analyzing the results of all 10 tradable sectors: (1) the situation where the urban consumer enjoys lower utility and private consumption due to a simultaneous decline in both the demand in import and locally manufactured goods in the sectors of food crops, cash crops and food processing; (2) the case where the urban consumer maintains the same utility and private consumption as observed in the sectors of consumer goods, intermediate goods, capital goods and private services where a drop in import's demand is compensated by an increase of demand of locally manufactured goods; (3) the case where the urban consumer enjoys higher utility and private consumption as observed in the sectors of forestry, cement & base metals and construction where both locally manufactured and imported goods are increasingly demanded. The difference of labour production elasticities in rural areas compared to the cities explain the results obtained from each case. In conclusion, the paper recommends to the government authorities to electrify and facilitate the availability of other goods' types in the rural areas so as to encourage the rural population to stay in villages and enjoy the same utility like the urban residents.**

**Key words:** Rural exodus, CGE model, consumer's utility, Armington function, substitution.

## INTRODUCTION

In Cameroon where 60% of population are rural people living from farming activities, the young farmers are being progressively discouraged by the less rewarding rural agricultural activities and prefer to migrate to the cities in order to improve their well-being. Their movement commonly known as "rural exodus" implies their displacement from the rural areas (villages) towards the cities in the search of better living conditions. Hence, the current urban population growth rate of about 5% per year in the main Cameroonian cities (Yaoundé, Douala, Bafoussam, Garoua, etc) is particularly attributed to the rural exodus which accounts for a rate of about 2.8% per year (Ministry of Plan, 2015).

This rural exodus mainly affects the young people between 15 to 35 years of age. This age group accounts for 30.3% of the total population of Cameroon. But because they originate from very poor families, over 43%

of these young migrants are strongly hit by poverty which the main factor is encouraging their movement from villages to cities leaving thereby only the older people in the villages (Emini et al., 2005; Zhu and Luo, 2010).

According to the World Bank (2015), about 25% of Cameroonian people (among which 80% are rural inhabitants) are currently undernourished and are living below the national poverty line. Poverty, migration and malnutrition are inter-related because poverty forces young farmers to migrate to cities and this migration of rural producers provokes a shortage of rural labour which in its turn results in lower food crop production in the villages (Jaza Folefack, 2015). Experts predict an aggravation over the years of the famine, malnutrition and poverty in big cities of the country due to rural exodus (Ministry of Agriculture, 2015). Up to now, urban agglomerations get more than half of their food supply

from rural areas. But while the production of food crop drops down in rural areas (due to the rural-to-city migration of farmers), the cities' demand in food as well as in other goods rather follows an increasing trend over the years (due to a high urban population growth rate). Hence, in order to satisfy the need of the urban population, the import of commodities is often necessary to supplement some locally manufactured products.

Cameroon being a "small country" in terms of trade, it depends on the international world market price for all traded goods i.e. any change in the price of imported goods at the world market is immediately transmitted to the price of corresponding locally manufactured goods in the country. After the country became a member of World Trade Organization (WTO) in 1995, the State disengagement and liberalization policy implemented in the economic activities led to the removal of most subsidies from all sectors (Defranc, 2005; Nchare, 2002). Still under trade liberalization, the cancellation of the main import tariff/non-tariff barriers has further engendered a market competition between the imported and locally manufactured goods giving rise to lower profit gained by local producers and encouraging urban consumers to purchase the imported goods in replacement of local commodities i.e. favouring thereby the substitution of locally manufactured commodities by imported goods, and vice-versa depending on the goods type.

As any rational consumer would like to maximize his utility subject to a budget constraint, the new migrant who arrives at the city has the possibility to substitute local goods by cheaper commodities imported from foreign countries (France, Germany, Japan, China, USA, etc). A few new migrants could afford some luxury goods which are not found in rural areas or substitute some local commodities by similar products of different variety and lower price. The multitude of several goods' varieties and cheapness of some imported goods in cities allow a new life style for young migrants. While some of them maintain their consumption habits, others would also like to taste some luxury goods which are inexistent and unaffordable in the rural areas.

In short, the plethora of people departures from rural areas could weaken the fragile balance of foods/goods' supply because a sharp increase in the number of urban consumers drains off a significant share of agricultural labour without providing anything in exchange. The effect on the consumption habits, tastes/preferences, utility or welfare of the urban consumer is still to be assessed. If nothing is done to follow up the situation, urban population may suffer for hunger or lack some goods types in the cities in the upcoming years. Hence, for future planning in terms of urban consumption and in order to offset the higher urban population growth rate resulting from rural exodus, it would be helpful to inform policy makers about the necessary demand of locally manufactured goods and their imported imperfect

substitute. This issue is important for Cameroonian authorities who would like to efficiently protect their population (by maintaining or improving their welfare and utility) as stated in the country's strategy of poverty eradication.

Hence, in relation to this issue, this paper specifically aims to answer to the following questions: What are the changes in demand of locally manufactured goods and their imported imperfect substitutes as larger number of people migrate from their native villages to cities? How is the utility of the urban consumer affected by the rural-to-city migration of people?

### Model description and verbal presentation

In this paper, the impact of rural exodus on the consumer's utility changes and demand for locally manufactured and imported good consumed in cities is analyzed by using a Cameroon's Computable General Equilibrium (CGE) model initially constructed by Condon et al. (1987) which was recently updated by Emini and World Bank (2004). The main features/characteristics of this CGE model are the followings (Emini and World Bank, 2004):

- 11 economic sectors with 10 tradables sectors and 1 non-tradable sector. The 10 tradable sectors of the model are: food crops, cash crops, forestry, food processing, consumer goods, intermediate goods, cement & base metals, capital goods, construction and private services. Public service is a non-tradable sector of the model.
- 3 labour categories with differentiated wages which are the: rural, urban unskilled and urban skilled labour categories. It should be noted however that, labour is mobile across sectors. That means, the same labour wage/salary rate is paid for each sector. The model also assumes that, this labour may or may not be fully employed.
- Capital is fixed in the model. It comprises of savings and investment.
- Institutions are the: households, government and firms.
- The goods consumed are produced domestically and one part is imported. The import and locally manufactured goods are assumed to be imperfect substitutes. The total domestic demand which aggregates import and locally manufactured goods is represented by the composite Armington utility function (Devarajan et al., 1997; Sadoulet and De Janvry, 1995).
- Model data are organized in the form of a Social Accounting Matrix (SAM) which was recently constructed by Emini and World Bank (2004). The model also uses the estimated production elasticities from the Cobb-Douglas production function for the three labour categories (rural, urban unskilled and

**Table 1:** Production elasticities from the Cobb-Douglas production function for the different labour categories.

Labour category	Rural	Urban-unskilled	Urban skilled
Food crops	0.592	0.058	-
Cash crops	0.483	0.055	0.061
Forestry	0.149	0.035	0.116
Food processing	0.124	0.090	0.226
Consumer goods	0.076	0.100	0.334
Intermediate goods	0.073	0.066	0.331
Cement & base metals	0.078	0.070	0.352
Capital goods	0.121	0.110	0.470
Construction	0.092	0.117	0.291
Private services	0.042	0.044	0.215
Public services	-	0.162	0.638

**Source:** Estimated production elasticities used in CGE model.

urban skilled) which are presented in Table 1. In order to achieve the study objective, we use that CGE model to measure the scenarios' effect of an increase in the rural exodus rate (by 5%, 10%, 15%, 20%, 25%, 30%, 35% and 40%, respectively) on the urban consumer's utility changes and demand of locally manufactured and imported good for each sector.

Our GCE model contains so many mathematical equations, but the main ones which were helpful to analyse these scenarios are namely the: production and input demand functions, composite Armington function, utility maximization and import demand function, composite consumer price function, and domestic price of import function.

Before the various scenarios were run, the model was validated and it was found that the baseline optimal solution from the model exactly displays the initial Social Accounting Matrix (SAM) as well as the field data with regards to the demands of locally manufactured and imported good for each sector.

## RESULTS AND DISCUSSION

As more people migrate from villages to cities, the consumer's utility and demand of locally manufactured and imported goods are measured for all the 10 tradable sectors. Three main cases are distinguished from the analysis of results by sectors:

- (1) The sectors displaying a decrease of urban consumer's utility;
- (2) The sectors showing a constant urban consumer's utility;
- (3) The sectors indicating an increase of urban consumer's utility.

This section presents all detailed simulated results from the three cases.

### Results of sectors with decreased urban consumer's utility

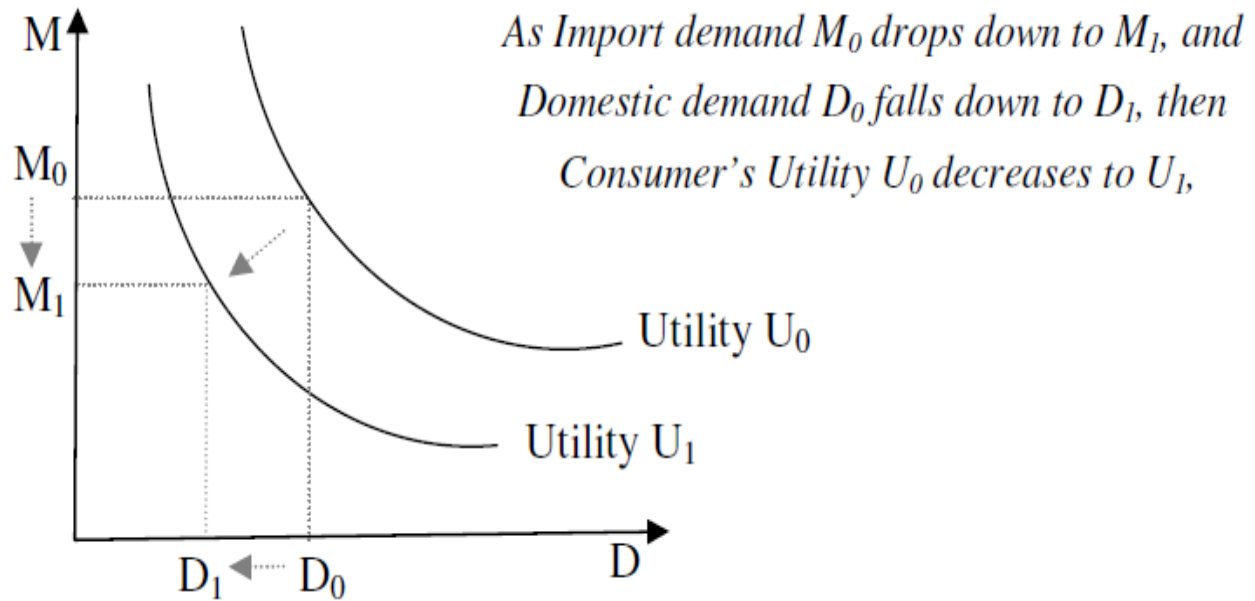
#### Representation of the utility function shifting inwards

As illustrated in Figure 1, before the rural exodus, the consumer maximizes his utility on  $U_0$  Armington function in which the combination of  $M_0$  import demand plus  $D_0$  locally manufactured good's demand is used to get this utility. With the rural exodus, there is a drop in the production of goods (possibly due to the labour shortage/scarcity in rural areas where those goods are mainly produced) and the new possible combination of the commodity's output which satisfies (or is affordable by) the urban consumer becomes  $M_1$  import demand plus  $D_1$  locally manufactured good's demand. Hence, both demands in import and locally manufactured goods are simultaneously decreased. In the new situation (after the migration has occurred), the urban consumer decreases his utility from  $U_0$  to  $U_1$  (he does not stay on the same utility function). Then, there is a movement of the Armington utility function shifting inwards from  $U_0$  to  $U_1$  (see Figure 1). This effect is similarly represented in a graph for each of the three cropping sectors (food crops, cash crops and food processing).

#### Computed results for the cropping sectors

For all the three cropping sectors (food crops, cash crops and food processing), the model results show a simultaneous decrease in the demand of both import and local production as more people migrate from villages to cities.

For instance, the simulated results of Table 2 suggest that, when the rate of rural exodus is increased by 5%, 10%, 15%, 20%, 25%, 30%, 35% and 40%, then the demand of locally produced food crops is decreased by 1.95%, 4.16%, 6.58%, 9.19%, 11.96%, 14.91%, 18.01% and 21.27%, respectively. The labour shortage (due to the rural-to-city migration of villagers/rural labourers)



**Figure 1:** Urban consumer enjoying lower utility (U) by decreased demands in import (M) and locally manufactured goods (D) through Armington utility function

prevents extensive farming activities and hence a reduction of the domestic production (Jaza Folefack, 2015).

Simultaneously, for the same rural-to-city migration rates, the import demand of food crops is decreased by 2.41%, 4.42%, 6.14%, 7.67%, 9.05%, 10.33%, 11.54% and 12.72%, respectively (Table 2). For each rate of rural exodus, as the demand in local production declines, there is also a drop in import demand so as to provoke an inwards shift of the Armington utility function. Hence, the urban consumers of food crops would enjoy lower utility as more people migrate from villages to the cities (Figure 1). Similar results are observed for the sectors of cash crops and food processing (Table 2). This is because, cash crops are mainly cultivated in rural areas as the food crops and the food to be processed comes firstly from the food crop cultivated in the rural areas.

As more people migrate from villages to cities, the decreasing trend of the demand of locally produced food crops, cash crops and food processing can better be understood by comparing the labour production elasticities of each of these sectors in rural and urban areas (Table 1). Data in Table 1 indicate that, for each of these three cropping sectors, the labour production elasticity of urban-unskilled<sup>1</sup> population is lower than that of the rural people. Thus, for these sectors, the labour is less productive in urban than in rural areas. Since the food crops, cash crops and food processing activities are mainly undertaken in rural areas and rarely in cities, this explains why a decrease of labour force in rural areas would tend to affect much more the production and hence, the local demand and import of these commodities.

### Results of sectors with constant urban consumer's utility

As more people migrate from villages to cities, the model results show a decrease in demand of import and an increase in demand of locally manufactured good mainly for the sectors of consumer goods, intermediate goods, capital goods and private services (Table 2). Graphically, in order to satisfy (or to enable) the urban consumer of those goods to maintain the same utility, we stay along the same Armington utility function which minimizes the cost of obtaining an "unit of utility" (there is a movement along the same Armington utility function  $U_0$  represented in Figure 1). The quality and/or price difference between the imported and domestically produced consumer goods justifies such an imperfect substitution.

At a 5% exodus rate for instance, an increase of 2.05% of increase in the demand of locally manufactured consumer goods must compensate a 0.07% of decrease in the demand of import of these goods. The same interpretation is also valid for the other rates of rural exodus for the sectors intermediate goods, capital goods and private services (Table 2).

As policy recommendations, in order to offset the rural exodus effect on urban consumption so as to maintain the same utility of the urban consumer, the government should implement policy measures which facilitate more domestic production of consumer goods in order to compensate the drop observed in the import of these goods. For this substitution to occur at a 5% exodus rate for instance, a proportion of 2.05% of increase in the demand of the locally manufactured consumer goods must replace 0.07% of decrease in the demand of

**Table 2:** Effect (in %) of rural exodus on the domestic demand (D) and import (M) of various goods from different sectors

Exodus rate		5% exodus	10% exodus	15% exodus	20% exodus	25% exodus	30% exodus	35% exodus	40% exodus
Food crops	D	-1.95	-4.16	-6.58	-9.19	-11.96	-14.91	-18.01	-21.27
	M	-2.41	-4.42	-6.14	-7.67	-9.05	-10.33	-11.54	-12.72
Cash crops	D	-0.37	-1.32	-2.75	-4.57	-6.74	-9.25	-12.09	-15.26
	M	-0.01	-0.02	-0.04	-0.06	-0.81	-1.78	-2.97	-4.36
Food processing	D	-0.06	-0.11	-0.23	-0.36	-1.22	-2.35	-3.77	-5.48
	M	-0.04	-0.08	-0.13	-0.18	-0.87	-1.75	-2.80	-4.00
Consumer goods	D	+2.05	+3.70	+5.05	+6.17	+7.11	+7.88	+8.52	+9.03
	M	-0.07	-0.26	-0.43	-1.19	-2.18	-3.38	-4.78	-6.37
Intermediate goods	D	+1.37	+2.48	+3.40	+4.18	+4.85	+5.43	+5.93	+6.38
	M	-0.39	-0.51	-0.63	-0.74	-0.87	-0.99	-1.06	-1.17
Capital goods	D	+1.66	+3.05	+4.26	+5.32	+6.26	+7.12	+7.91	+8.64
	M	-0.47	-0.71	-0.89	-0.98	-1.27	-1.45	-1.68	-1.87
Private services	D	+0.93	+1.64	+2.19	+2.61	+2.92	+3.14	+3.28	+3.33
	M	-0.17	-0.29	-0.45	-0.68	-0.87	-1.04	-1.15	-1.27
Forestry sector	D	+0.40	+0.68	+0.86	+0.97	+1.01	+1.10	+1.32	+1.45
	M	+2.28	+4.17	+5.78	+7.19	+8.44	+9.57	+10.62	+11.59
Cement & base metals	D	+1.66	+3.11	+4.40	+5.59	+6.70	+7.76	+8.77	+9.75
	M	+0.06	+0.24	+0.96	+1.19	+2.18	+3.38	+4.78	+6.37
Construction sector	D	+0.89	+1.54	+2.00	+2.31	+2.49	+2.55	+2.52	+2.40
	M	+0.04	+0.10	+0.48	+0.96	+1.07	+1.49	+1.76	+2.01

Notes: D=Domestic demand; M=Import demand.

Source: Simulated results from the CGE model.

imported consumer goods (Table 2). The State must therefore equilibrate 0.07% from the value spent on import with 2.05% of the value received on domestic sales. Failure by the State to do such compensation may be at the disadvantage of the urban consumers who may suffer from the lack of some consumer goods' types at the cities. Due to rural exodus, the number of urban consumers is becoming higher over the years. Hence, if the problem is not treated seriously, this would decrease the marginal utility of each additional urban consumer of consumer goods.

The field reality also testifies the observed trends. For instance, the increasing demand of the locally manufactured consumer goods could be due to the large number of people (either unskilled or skilled) who recently came from the villages in order to settle down in the cities in the search of luxury/well-being (which is partly provided by the consumer goods). Since the rural inhabitants could not find such luxurious living conditions in the villages, they are now attracted to the cities in order to enjoy the luxury consumer goods. According to the Cameroonian Ministry of Plan (2015), the consumer goods are costly and thus, not at the reach of the poor category of rural population. Hence, most villagers migrate to the cities in the search of the luxurious utility from consumer goods.

The consumer goods, intermediate goods, capital goods and private services are mainly affordable and consumed by the rich Cameroonians mostly represented by the urban skilled category of people. Hence, the increasing demand for the locally manufactured

consumer, intermediate and capital goods could be attributed to the higher labour production elasticity of the urban skilled population as compared to that of the rural population (Table 1). This means that, the labour is more productive in urban than in rural areas. This explains why the domestic demand of consumer, intermediate and capital goods increases as more people migrate to the cities. Hence, the substitution of import by domestic production for these goods could be justified from these grounds.

### Results of sectors with increased urban consumer's utility

The sectors of forestry, cement & base metals and construction show an increase in both the demands of import and locally manufactured goods. The resulting increase in urban consumer's utility is then subsequently observed. The graphical representation would show an opposite movement of the phenomenon represented in Figure 1 (the Armington utility function would shift outwards in this case).

Table 2 shows the effect of rural exodus on the import and domestic demand of the forestry sector. For instance, a 5% exodus rate leads to an increase in the demands of both the import and locally manufactured forest products by respectively +2.28% and +0.40%, allowing the urban population to enjoy a higher utility from the consumption of forest products. The other rates of rural exodus show the same trends. Similar results are observed for the sectors of cement & base metals and

construction (Table 2).

The forestry, construction materials and construction are mainly undertaken in cities by skilled people graduated from higher schools or universities. Remarkably in each of these sectors, the labour production elasticity of urban skilled population is always higher compared to that of the rural population and this clearly explains why labour is more productive in cities than in rural areas for these sectors. Hence, the trend from our computed results and namely the outwards shift of the Armington utility function are explained by these labour production elasticities (Table 1).

## CONCLUSION AND RECOMMENDATIONS

In Cameroon, young people are progressively migrating from their native villages to the cities (at a rate of 2.8% per year). The crowding of people invading the cities every day is about to affect the consumer's utility and demand of main goods' types consumed by the urban population. Hence, this paper assesses the changes in import and locally manufactured goods demanded by the urban consumer. By simulating the rural exodus effect on the urban consumer's utility changes, three main cases are distinguished:

(1) As more rural people migrate to the cities, the utility of the urban consumer is decreased for each of the three cropping sectors (food crops, cash crops and food processing) which show a drop in both the demands of the locally produced goods and import of those goods. Hence, the Armington utility function would shift inwards for goods from these sectors. These are sectors where activities mainly take place in the rural areas and which suffer much more from the lack of their labourers who migrated to the cities.

(2) Conversely, the arrival of new migrants in cities leads to an increase in demand of the locally manufactured goods in some sectors (consumer goods, capital goods, intermediate goods and private services) thereby turning the import's demand to decline for goods from those sectors. The fact that new urban residents work as unskilled labourers in cities is favourable to the increase of the domestically produced goods from those sectors. This increase in demand of domestically produced goods helping to compensate the decline in demand of their imports' substitute implies that, the utility of the urban consumer is maintained at the same level according to the Armington utility function.

(3) However, the urban consumer enjoys a higher utility for the three other sectors (forestry, cement & base metals, construction) where both the demand in import and locally manufactured goods are simultaneously increased. The higher consumer's utility is materialized by the Armington utility function shifting outwards for these sectors mainly undertaken within the urban and

peri-urban zones.

The higher labour production elasticities in cities compared to rural areas explains the two latter cases whereas the first case is justified by the lower urban's labour production elasticities for these sectors.

We consequently conclude that, if the rural exodus is not alleviated at present, it could then aggravate the famine, malnutrition and poverty which already prevail in Cameroon (about 43% of people are currently undernourished and below the national poverty line) (World Bank, 2015). Hence, in order to prevent the rural exodus and its negative consequences on urban food security, the government should implement policies which promote for instance the electrification of rural areas and facilitate the availability of other consumer goods' types (usually found in cities) to the rural population. For instance, the electricity supply to rural areas would enable rural population to also enjoy luxury utility from modern consumer goods such as radio, television, refrigerators, computer, handy phones, etc. This would motivate rural people to continuously stay in the villages rather than migrating to the city.

Because the rural people are attracted to cities in order to enjoy higher utility from consumer goods which are inexistent or rare in villages by lack of electricity (less than 6% of the rural population are connected to electricity as compared to 20% for urban residents), the electrification of rural areas by the government would encourage the country's population to stay in villages and enjoy the same utility like the urban residents.

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<sup>i</sup> Most rural labourers become unskilled workers after their migration to the cities [see Jaza Folefack (2015)].