# Puzzle contribution of traditional alcoholic drinks to the weillbeing of rural Populations

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27 January 2015

# PUZZLE CONTRIBUTION OF TRADITIONAL ALCOHOLIC DRINKS TO THE WELLBEING OF RURAL POPULATIONS

# Working paper

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## ABSTRACT

Cultural practices and traditional events in Africa present traditional alcoholic drinks as imperative for the credibility of the ceremonial but unfortunately these drinks are highly concentrated in toxic contents that hinder seriously the health of its consumers. Thus, the objective of this study was to shed more light on rural development policies that advocate for improved health and reduce social disorder engendered by consumption of local alcohols in rural areas. The methodology of the study was the cost-benefit analysis to understand the economic profit generated by these drinks, and multi-dimensional analysis technique to highlight key variables to target to reduce the fatal health and social disorder consequences from the consumption of these drinks. Data was collected in 2012 in the East of Cameroon; with the financial support of the Japan International Cooperation Agency through the Forest Savannah Sustainability Project. Two methods were used for data gathering: census to identify all the actors in the study's area and reasoned choice for the selection of various villages of study and various field activities. Instruments used were questionnaires, interviews guides, focus group discussions and full participation in production, distribution and consumption of these drinks. A sample of 119 households was constituted from equal representations from the chosen villages. Cost of production, examined rigorously through a

cost-benefit analysis was paralleled to profit. Also, factor analysis identified at least three main components that embody almost all the socio-economic variables of interested. Data was prepared in Excel and analysed with STATISTICA software package. Results revealed that real motivations of rural population to involve in these drinks was mainly poverty and unemployment. The study acknowledged cultural importance of these drinks but to a weak proportion and proposed a different pattern to reduce negative outcome without jeopardizing the traditional values of the drinks. Reduce production and consumption quantities of drinks limited to temporal and solemn ceremonies; by creating jobs not only for the producers but also for all other actors of the value chain of local drinks. These jobs should be particular with short term and frequent income generating activities. Rural population should also be educated regularly on negative effects of these drinks and gender analysis may share more light for better management of this problem.

**Key words***:  local alcohol, factor/cost analyses, multidimensional analysis, Cameroon

**INTRODUCTION**

Consuming alcohol in different socio-cultural milieux has increased significantly since the last ten years [1, 2]. In Africa, these local alcoholic beverages such as palm wine, afofo, shaa , raffia fine et cetera were consumed for pleasure soon after brewing or tapping and usually around a particular event or not[3,4]. Though alcoholic beverages have been consumed for hundreds of years, the pattern and purpose of consumption varied considerably among societies and even within communities[1]. However, the consequences of these drinks on rural populations are the same everywhere and affect health in a slow but very serious manner [5]. In addition, evaluating the drinking patterns and its impact on alcohol-related aggression of recent reveals that; excess alcohol consumption was not widely tolerated in many societies [6]. Its abuse attracted sanctions by most religious and moral believes and convictions [7, 8]. Even though from one denomination to another or village, different methods of production of local alcoholic beverages distinguish ethnic groups. The colonial period recorded an impressive range of these drinks. Their marketing channels competed the imported strong drinks of the colonial masters. This led to the prohibition of production and sale of traditional drinks in many regions [9].

In the south of Nigeria as well as the East rural areas of Cameroon, palm wine was well-known [10]. In addition, the native gin locally called ogogoro, kai-kai akpuru-achia, or Sapele water, distilled from fermentation of palm wine or raffia wine was known as a drink with highest adverse health and physical problem [11]. Nevertheless, it was widely consumed, especially in the Niger-delta area Nigeria, the west and the east regions of Cameroon [12]. No written rules prohibited females and adolescents from drinking in these traditional eras [13] but consumption was the reserve of men and played a crucial role in political, religious and socio-economic relationships [14].

Traditional drinks played complex roles in religious and communities' rituals and served as a catalyser for social cohesion. Yet inhibited by religion prior to the advent of

colonialism, drinking of alcohol was culturally tolerated as part of ceremonial lives of many ethnic groups in Cameroon and Nigeria [9, 10, 11]. These traditional beverages are a key requirement in the bridal price to consummate marriages in villages and at ceremonies like cultural festivals, chieftaincy enthronements, child dedications and even funerals [1, 14]. They contribute to the livelihood of rural population; unfortunately with serious perturbation power on rural dwellers [15, 16] that mitigates its multidimensional importance in the community.

In developing countries, traditional drinks are advocated to improve the taste of food, enhance the digestibility of food, slow food degradation by noxious organisms, and increase nutritional values[17, 18]. Furthermore, they are used for medical reasons, recreational purposes, in marriages, in religious and nonreligious ceremonies, at festivals and social gatherings, at burial ceremonies and as food substitutes [19]. The above may justify why in recent decades, the pattern, quantity, and reason for consuming are changing rapidly, especially among youths [20] and its marketing is almost similar to that of conventional drinks.

Traditional drinks, rarely traded in ancient period, are now stocked for days before consumption with the purpose of selling at a better price [5]. This condition has resulted in an increased burden of their alcohol-related problems, estimated to exceed those of tobacco consumption. Alcohol misuse can result in death of the user (and non-users, due to drunk working and other related accidents) and often disability in early years among young people [21, 22]. Beside the differences in the inputs used to produce these drinks, the mixture method, fermentation process, and timing or even distillation presented some differentials [23, 24]. The latter resulted to local alcoholic beverages with chemical compositions that differ enormously from the usual, what resulted on different by more serious effects on human health [25]. The situation is very frightening since in Ethiopia, these fermented beverages (tella, tej, borde and shamita), which are very popular local drinks, are consumed in very large quantities and most often to intoxication levels until the drink for the ceremony is finished[26, 27]. The situation is worst in the east of Cameroon where more than 30

persons were reported death in 2016 after consuming the famous local *kembe*, distilled from palm fine and this scenarios are frequent since the considerable development of the commercialization of these drinks.

With colonization and the influx of western cultures, alcoholic beverages from western countries became readily available to both old and young, male and female, in urban or rural areas and on a commercial basis. This gave a new reorientation towards profit resulting in the constitution of stocks of the local alcoholic drinks in order to sell it at better prices on a well-chosen day with preferable profit [20]. Keeping these beverages several days before consumption for profit reasons accentuates their fermentation and correlatively their composition.

The chemical analysis of local drinks brought new information about toxic components produced in these drinks, due to inadequate fermentation and/or distillation, and/or manipulation process which resulted on different effects on consumers [28]. the inadequate fermentation methods under which these local alcohols are produced, which are just adaptable at household level in traditional communities may also justify the high toxic content of these drinks [29]. Beers showed the most homogenous cluster while homemade spirits revealed a large dispersion and variation regarding their chemical structure. Some of these congeners have been identified constantly in traditional alcoholic beverages: acetone, methanol, 1-butanol, 2-butanol, methyl-ethyl-acetone, isobutanol, 2-methyl-1-butanol, 3methyl1-butanol, n-propanol [30]. All these components are very dangerous to health especially methanol. The latter is the main component of discriminating efficiency between industrial manufactured alcohol and homemade traditional spirits consumed in Romania [30]. The rural population, due to its limited knowledge on fermentation, produces drinks without considering the concentrations of the above-mentioned substances [30]. Consequently, the consumption of these alcohols which are produced from different brewing products, may have several damaging effects such as: mental problems, job trouble, loss of control, impaired judgment in humans and irresponsible behaviour [21, 22]. However, alcohol

problems vary from one person to another; it depends on the dose and the quantity consumed regularity [15, 16]. Whatever the case, there is considerable evidence-that most traditional alcohols are known to have toxic components [28]. A memorable acknowledgment date is 28th October 2013; where Kenya promulgated an Alcoholic Drinks Control Amendment Bill, which laid more emphasis on control but this did not stop the death of 63 persons in this country in May 2014 due to consumption of these local alcoholic drinks [12]. However, Changing Patterns of Alcohol Consumption in Cameroon through an exploration of responsible factors and consequences will be a contribution to understanding this problem [1].

In Cameroon, most studies on alcohol focus on it health and social consequences in general. There is a large brand of local alcoholic drinks produced not only in the East but everywhere in Cameroon. Some drinks like palm wine, *kembe* or *mbotorow* are even exported. Unfortunately, the presence of the physio-chemical components like ethanol level, acidity, turbidity, methanol and other chemicals of these traditional alcohols put them as permanent danger for the rural population. Their inadequate production methods are due to extreme poverty in rural areas whereas the control of fermentation processes of alcohol requires expensive equipment. In addition, the severity of problems caused by these local alcohols imposes that action should be taken to reduce sufferings. Hence, these alarming facts between the high cost of normative method (the equipment to standardize the alcohol production) and the high health cost consequences (diseases, sufferings, et cetera.) in rural areas constitute the premise of this study. It reorients the reflection towards a preventive approach of alcohol problems by investigating reasons for the consumption of these traditional alcoholic drinks among rural population. Most studies in this area focus on health consequences of alcohol consumption or negative social impact, following the consumption of these drinks. Some studies present local alcoholic drinks as cluster to culture. Putting the right question on the motivation of rural population to involve in these local drinks will enable efficient policy making in this area in favour of wellbeing. Thus, this paper brings both a theoretical and methodological contribution in the area: firstly, its attempts to help reduce rural population sufferings by advocating for efficient policy making. Secondly, it uses a

multidimensional method coupled with a cost-benefit technique to scrutinize the determinats of local drinks and emphasize efficient strategies to help tackle the problem local alcohol abuse. What are the real motivations of rural population to produce traditional alcoholic drinks?

**METHODOLOGY**

The methodology adopted in this research was the cost-benefit analysis to compute some socio-economic variables of the traditional alcohol producers. The factor analysis clustered the variables to some factors to help interpret the data. Data was collected with the financial support of the Japan International Cooperation Agency in the framework of the Forest Savannah Sustainability Project. The data were collected in 2012 in the East of Cameroon. Two methods used for data gathering: census to identify all the actors in the study's area and reasoned choice for the various areas of study and to choose the actors. The actors are producers and/or distributors (sellers) and/or consumers. The data collection was through questionnaires, interviews, focus groups and participating in all activities involving production and consumption of the traditional alcoholic drinks. The investigator simultaneously, following answers to put questions, filled the questionnaires. The sample size was constituted of 119 households(equal number of households for each of the considered villages). The analysis used twenty-six variables to capture the prime aspects of this indigenous alcohol activity. The work examined the cost of production rigorously through a cost-benefit analysis as follows:

- Fixed cost related to the necessary material for the production and/or the sale of traditional alcoholic drinks;

- Variable cost related to the purchase of raw material to produce a given alcoholic drink. Mbotorow's production for example needs cassava, corn, sugar, extra;

- Labour cost is the compensation of the energy and time spent by the actors. It also includes the minimum number of persons needed for production;

- Transport cost gives an idea of the places of production (the forest, the bushes, or the village).

- Total cost is the sum of all the above mentioned plus local taxes;

To estimate the quantities produced, a series of questions helped to rebuild progressively with the collaboration of the households total productions per year. Due to price fluctuations, we consider the mean prices of local market in this study. The aforementioned needs added to the local council levy make the *total cost*. Profit is the difference of the *total revenue* obtained from the sale of traditional drinks and their cost. Social indicators such as *age, gender, marital status, financial situation* and others also help to capture some behavioural key determinants in rural area.

Factor analysis is a multi-dimensional econometric method that helps to do analyses on a large number of variables by reducing them to small number of new but fewer variables called factors whose analysis enable to understand the initial ones correctly. For this study, the software output identified four factors, even though we limited the analyses to three since, they embodied all the characteristics of the aforementioned socio-economic variables. For an efficient realization of the objective, we used sequential plane graphs. The data was prepared in Excel and the analyses done with SPSS and STATISTICA software packages. All the prices estimated in the work were in US dollars.

## RESULTS

From the factor analysis method, the socio-economic variables produced three new variables (factors). In fact, from the initial matrix of 119 (households) × 26 (variables), a new matrix is created with 26 (Variables) × three (factors) as shown in Fig.1.
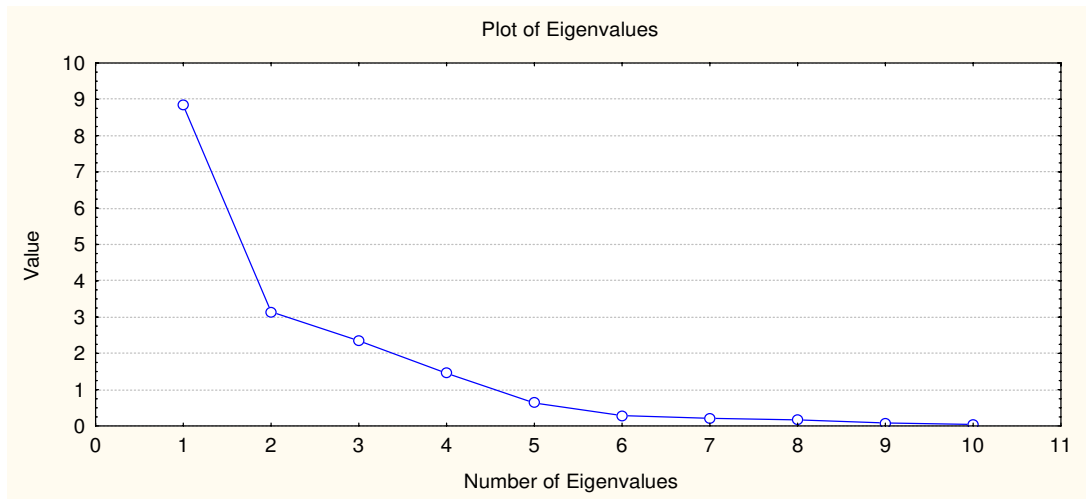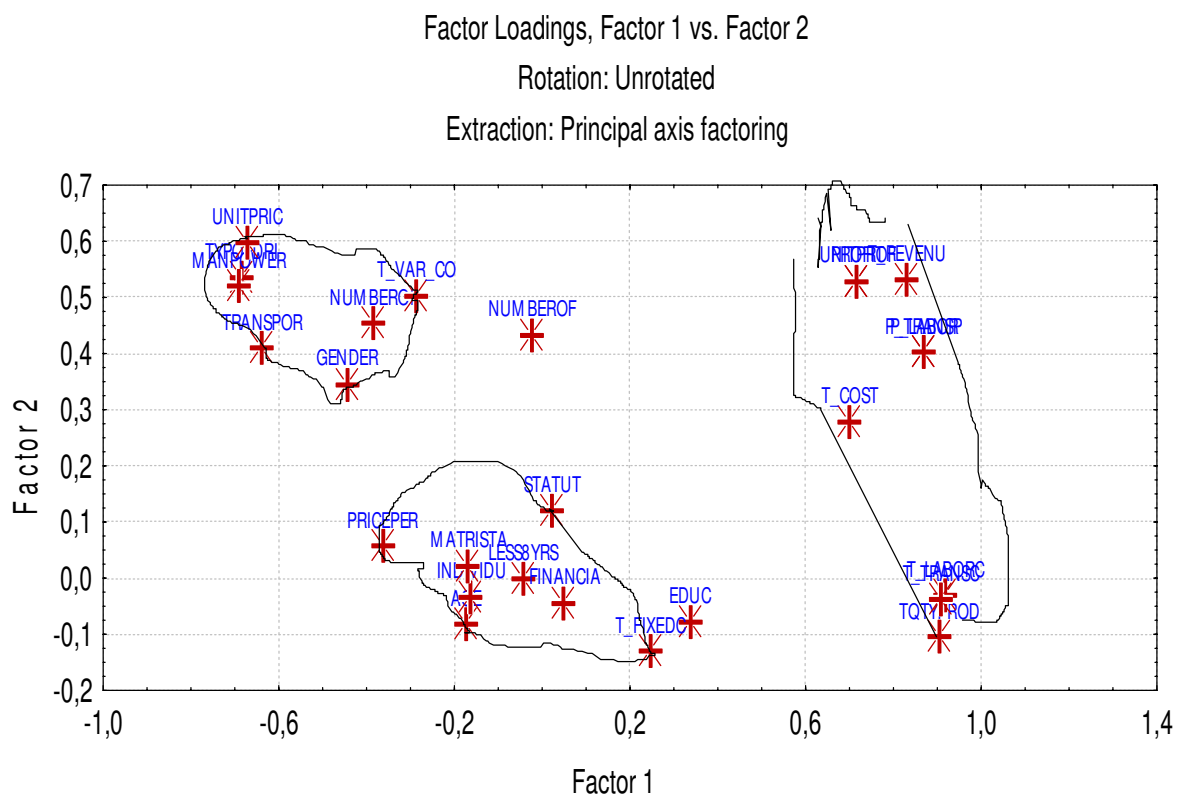


Figure 1: representation of the number of eigen values to be considered

Figure 1 brings strength and understanding of the eigenvalues as plotted in table one with the contribution of each factor. From Table 1, eigenvalues accounts for 72% when we consider three factors. The principle is that of multidimensional analysis: factor 1 has more weight than factor 2 and its variables are to be consider more seriously because they are of prime importance. A better understanding of Table 1 is the contribution of each of the socio-economic variables to the various factor as shown in Table 2. Some variables (in Table 2) such as *total labor* produced by all activities around the drinks (0.84), *total quantities* of these drinks produced (0.82); contribute the most to factor one. On the other hand, factor two is highly influenced by *total revenue* obtained by the rural population from these drinks (0.96), *profit* from the alcoholic drinks *without the family labor* (0.91) and *profit* from the alcoholic drinks *without family transport*. *Total revenue* and *profit* also influence factor three significantly. The last colon of Table 2 shows a significant influence of *gender* (0.59) in alcohol activities, but on the opposite, it fails to highlight sufficiently the cultural role attributed to these drinks view here through the variables *age* and *societal status*. The information on job creation produced by table two is bias because from colon four, the difference between the variable *profit with labour* on one hand (0.934) and *profit without*

*transport and/or profit without labour* (0.943 each) is not really significant. One may think that this job created in this activity is fallacious.

Figure 2 is a representation of factors one and two. It shows three groups of variables. The nearer a group is to the origin of the axes, the weaker it affects the factor. *profit, total revenue, total cost* influence both factors, stipulating a possibility of a strong link between these activities and not only unemployment but poverty as well. This idea is strengthened when we look at the variables influencing factor two (this is the set close to factor two on figure two). *Unit price of the drink, gender, labour…* point out the fact that there is a relationship between the prices of drinks and consuming habit. In general, traditional alcoholic drinks prices are lower than that of standard alcohols. *Manpower (labour)* and *quantities of drink produced* are also important contributors to component two. These variables reinforce the suspicion of unemployment and poverty that emerged from Table two.



Factor Loadings, Factor 1 vs. Factor 2
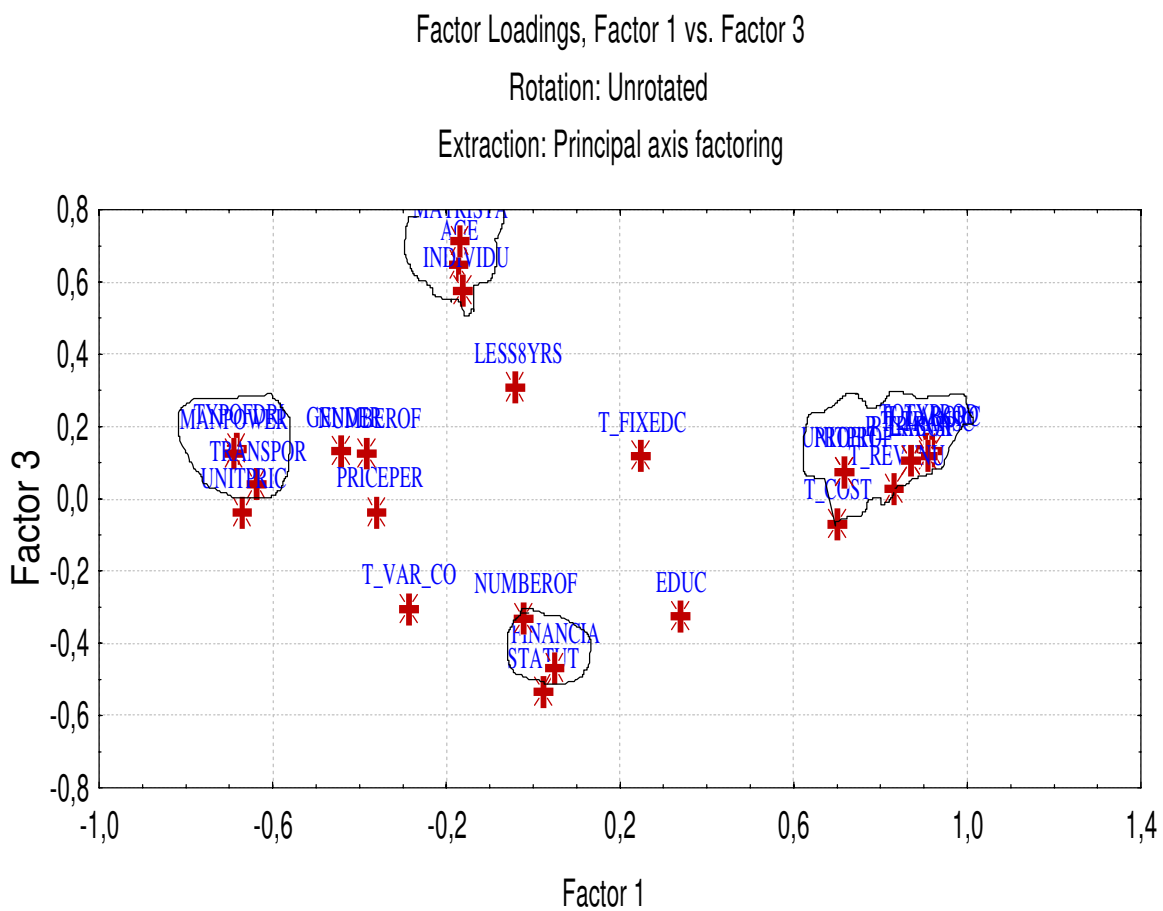Rotation: Unrotated
Extraction: Principal axis factoring

*Upper left of the figure: UNITPRIC, TYPEOFDRI, MANPOWER, …
*Upper right of the figure: T_REVENU, UNITPROF, P_LABOR, P_TRANSP
*Down left of the figure: TQTYPROD, T_LABORC, T_TRANSC

Figure 2: correlation between factor 1 and factor 2

The relationship between factor two and factor three in Fig.3 also brings out some sets of variables of great contribution. *Profit* and *revenue* still came up with a high significance. In addition, *financial status* appeared to complete the influence of *price of drinks*, *manpower...* The new information here is the high contribution of *age* and *social status* to factor three. This may explain the cultural and social role that these drinks consolidate, even though it is just a small percentage of the 10.44% variance covered by factor three.
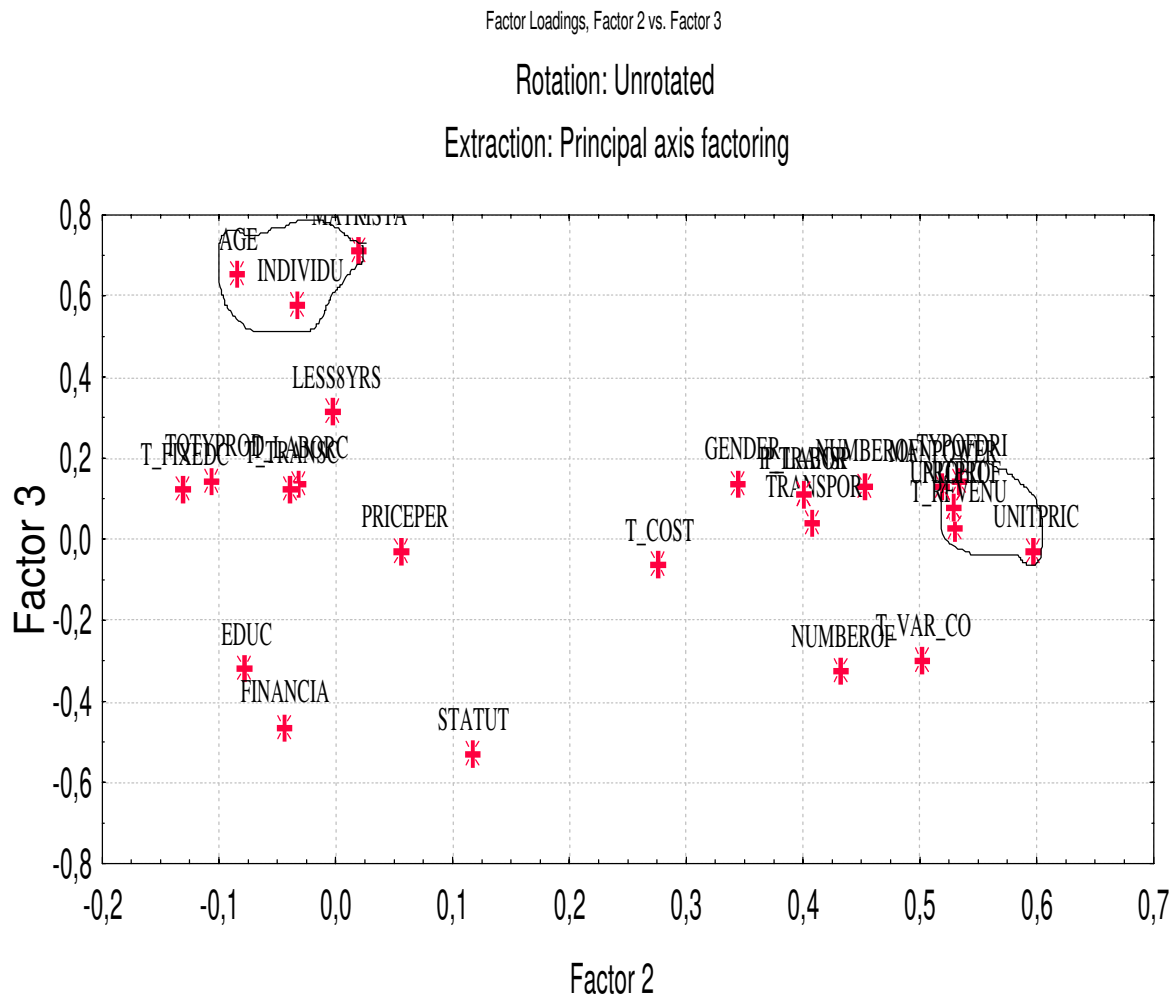


Factor Loadings, Factor 1 vs. Factor 3
Rotation: Unrotated
Extraction: Principal axis factoring

* At the top of the figure: AGE, INDIVIDU, MATRISTA
*At the middle left: TYPEOFDRI, MANPOWER, TRANSPOR, UNITPRIC, GENDER, NUMBEROF, PRICEPER
* middle right: T_COST, T_REVENU, TQTYPROD, UNITPROF, PROFIT, P_LABOR,

Figure 3: Relationship between factors 1 and factor 3

Fig.4 is the representation of factor two and factor three. Insisting on the notable presence of income variables on factor two, it highlights the significant contribution of *age,*

*matrimonial status, and number of individuals per household* to factor three. *Age*, in addition to the cultural role of these drinks it incarnates, shows the heterogeneity of drinking in rural areas at different ages. *Matrimonial status* implies that bachelors may also present some differences in drinking habits as opposed to married consumers whose consumption is probably squeeze by the size of their household.



Factor Loadings, Factor 2 vs. Factor 3

Rotation: Unrotated

Extraction: Principal axis factoring

*Upper left : MATRISTA, AGE, INDIVIDU, LESS8YRS,
*In the middle left:  TQTYPROD and T_LABORC, T_FIXEDC, T_TRANSC
*Middle right: GENDER, TRANSPORT, NUMBEROF, TYPEOFDRI, T_REVENU, UNITPROF, P_TRANSP, UNITPRIC, MANPOWER.

Figure 4: representation of the relationship between factors 2 and factor 3

**DISCUSSION**

Comparing *profit without manpower* (labour) to *profit with manpower* which is essentially family labour, the difference of both situations do not significantly reflect the job creation hypothesis of these activities (94% & 93% respectively). This proves that the job creation put forward by traditional alcohol businesses is crumbly and thus the total variance of manpower of 78 % of all the factors is completely dissolved in the total cost of production of 92% of the factors. The contribution of less than 94% of revenue is cancelled by the 92% cost (Table two). This implies that alcohol sector creates revenue that it absorbs totally at the end bringing us to a zero financial profit but with health and social problems. The significance of variable *age* indicates that not only consumers neglect their health but they also believe that these alcoholic drinks, precisely the spirits, can cure many diseases in children and thus give it to the latter to consume frequently. Education, as pointed out in Fig.2, should therefore accompany the action of permanent short-term revenue jobs creation among the rural population. These changes of activity, as time goes on, will be threatened not only by high but very rare consumptions during cultural ceremonies as pointed out in Fig.3 and Fig.4. Targeting the creation of jobs that produce short-term revenue and occupy the population at a minimum of seven hours every day will reduce their alcohol drinking habit considerably. There should also be the creation of distraction points in the rural area and frequent educative seminars on the effects of abuse of these drinks on the human body. The temporal drinking must be highly scrutinized. Consumptions must consider *age*, *gender, and marital status* and most importantly, the type of drink and the quantities consumed each time.

**CONCLUSION**

The objective of this study was to shed more light on rural development policies, in order to reduce health and social disorder linked to the effects of alcohol consumed in rural areas. The methodology used in this research lied on cost-benefit and multi-dimensional analyses methods. The analysis demonstrated clearly that the rural population go for traditional alcoholic drinks for social needs. It further explains a stronger implication of the rural population into the drinks due to poverty and joblessness. In addition, the study highlights the spurious nature of the jobs created by these activities and the negative health problems that accompanied the consumption of these drinks. Finally, it proposes some solutions that could reduce the sufferings of the population due to the consumption of local alcoholic drinks. The creation of fast revenues jobs, which can keep the population busy and which absorbs all the instigators of the value chain of the drinks will influence strongly the quantity produced, the time for distribution and consequently the final quantities consumed.

**LIMITATIONS OF THE STUDY**

There was no method to detect false information when collecting data. A second problem was that of missing values, which are also a poison to survey data. One is rarely satisfied with this size of the sample as far as survey data is concerned. It is also our claim to think that if this sample was larger, maybe it will have been more representative of the country population.

**Table one: Multidimensional socio-economic characteristics of local alcohol consumption**

| FACTOR ANALYSIS | Eigenvalues Extraction | Principal axis factoring | | |
| --- | --- | --- | --- | --- |
| | Eigenval | %total Variance | Cumul. Eigenval | Cumul. |
| Value | | | | |
| 1 | 8.999 | 34.612 | 8.999 | 34.612 |
| 2 | 7.023 | 27.012 | 16.022 | 61.624 |
| 3 | 2.716 | 10.447 | 18.738 | 72.071 |

Table two: <u>**computer output of the different contributions of the variables to the Factors obtained from multi-dimensional analysis**</u>

Factor Analysis     Extraction : Principal axis factoring

| Variab1e | From Factor 1 | From Factor 2 | From Factors 3 | Multiple R-Square |
|---|---|---|---|---|
| GENDER | .197649 | .316877 | .335073 | .591665 |
| AGE | .030270 | .037344 | .461558 | .408472 |
| EDUC | .113504 | .119522 | .223339 | .309144 |
| STATUT | .000476 | .014415 | .298615 | .410337 |
| INDIVIDU | .026321 | .027402 | .358399 | .389395 |
| MATRISTA | .028399 | .028808 | .536352 | .484080 |
| LESS8YRS | .001898 | .001901 | .098841 | .194536 |
| FINANCIA | .002487 | .004423 | .220387 | .338489 |
| TYPOFDRÏ | .468608 | .754062 | .774032 | .797841 |
| MANPOWER | .478570 | .748023 | .764541 | .786440 |
| NUMBEROF | .000522 | .187194 | .294372 | .665215 |
| PRICEPER | .131290 | .134441 | .135524 | .596412 |
| NUMBER | .147348 | .352626 | .369683 | .579169 |
| TRANSPOR | .406273 | .573232 | .574900 | .676515 |
| UNITPRIC | .451878 | .808841 | .809951 | .850465 |
| TQTYPROD | .820133 | .831357 | .851885 | .932624 |
| T VAR CO | .082682 | .334642 | .425015 | .863853 |
| T FIXEDC | .060925 | .078088 | .092699 | .308151 |
| T LABORC | .841451 | .842452 | .861160 | .937183 |
| T TRANSC | .823085 | .824553 | .839957 | .935597 |
| T COST | .490244 | .566804 | .571253 | .926336 |
| T REVENU | .688068 | .969635 | .970415 | .942341 |
| PROFIT | .515074 | .794624 | .800639 | .934799 |
| UNITPROF | .515074 | .794624 | .800639 | .934799 |
| P LABOR | .754725 | .915759 | .927938 | .943043 |
| PTRANSP | .754725 | .915759 | .927938 | .943043 |

Table three: **Codification of variables analysed**

| NUMBER | VARIABLE | SIGNIFICANCE |
|---|---|---|
| 01 | GENDER | sex of the actor |
| 02 | AGE | age of the actor |
| 03 | EDU | Education level of the actor |
| 04 | STATUT | status in the society of the actor |
| 05 | INDIVIDU | Number of individuals per household |
| 06 | MATRISTA | Marital status |
| 07 | LESS8YRS | Number of children less than eight years old |
| 08 | FINANCIA | Financial charges of the actor |
| 09 | TYPEOFDRI | Types of drinks produced by the actor |
| 10 | MANPOWER | Types of labour used by the actor(family, external) |
| 11 | NUMBEROF | Number of Persons needed to produce a chosen type of drink |
| 12 | PRICEPER | Inputs Prices (rural or urban area) for a chosen drink |
| 13 | NUMBER | Number of liters produced per considered unit per year |
| 14 | TRANSPOR | Transport cost(familiar or external) per actor per drink |
| 15 | UNITPRIC | Unit price (rural and urban area) of a chosen drink |
| 16 | TQTYPROD | Total yearly produced drink per statistical unit per drink |
| 17 | T_VAR_CO | total cost of the raw input needed for production of a drink |
| 18 | T_FIXEDC | total cost of the material to use for the production of a drink |
| 19 | T_LABORC | labour cost for the production of a liter of a drink |
| 20 | T_TRANSC | Transport cost of transactions related to a liter of drink |
| 21 | T_COST | Sum of all costs around production of a given drink |
| 22 | T_REVENU | Total revenue from total quantity produced yearly |
| 23 | PROFIT | yearly Profit from the activity |
| 24 | UNITPROF | Profit per liter of the drink considered |
| 25 | P_LABOR | Profit without labour(both family and external) |
| 26 | P_TRANSP | Profit without transport(both family and external) |

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