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# Circular labor migration and food security in Lake Victoria Basin: A case of Muleba and Ukerewe Districts-Tanzania

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**Circular labor migration has been inconclusively debated to result into a win to migrants, their place of origin and families as well. However, empirical evidence has resulted in a very contradicting conclusion. Moreover, the specific wins in wide spectrum of life have neither been unveiled nor tested. This study intends to assess the implications of circular labor migration on food security in Lake Victoria Basin. A total of 512 households randomly sampled from the two wards were used. Methods of data collection were household survey, focus group discussion and key informant interview. Data analysis was done using IBM SPSS. Techniques of data analysis including chi-square, independent sample t-tests and paired sample T-Tests were used in the analysis. Results indicated that food security status varied across localities with a worsening situation in Kakukuru than in Nyakabango. Households' involvement in circular labor migration improves food security status of the household. Food security status improved as the number of circular labor migrants increased but it had a declining trend beyond 2 and 4 for both HDDS and HFIAS measure. Based on the findings, the study recommends that, circular labor migrants should be encouraged to invest their return from circular labor migration in improving household food security; households should control the number of household members involved in circular labor migration if the current work environment continues to exist. Researchers should consider the contextual and locational differences when looking into food security.**

**Key words:** Circular labor migration, Lake Victoria Basin, food security, Ukerewe, Muleba.

## INTRODUCTION

Circular labor migration is advocated to results into a triple win; meaning that involvement in circular labor migration benefits three categories of people namely; people living at *migrants' place of origin*, *destination* as well *as migrants and their families* (IOM, 2008; EMN, 2010; UNECE, 2016). While scholars are almost in

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common agreement regarding the win to the destination community (Castles and Ozkul, 2014; UNECE, 2016; Wickramasekara, 2011), the arguments on the win to migrants' origin as well as migrants and their families have bared mixed views among scholars (Rodriguez, 2010; Wickramasekara, 2011). The proponents of a triple win terminology are of the view that remittance gained from involvement in circular labor migration can be utilized by the sending community and migrants to enhance their win, while the destination community benefits through cheap labor without adding permanent migrants to their own community (EMN, 2010; GCIM, 2005; UNECE, 2016). On the other hand, the opponents' arguments are centered on the fact that unfavorable labor market structure and risks involved creates disequilibrium in gains and therefore, the advocated triple win is very difficult to achieve on the ground (Deshingkar and Farrington, 2009; Rodriguez, 2010; Agunias and Newland, 2007; Wickramasekara, 2011). Notwithstanding the existing inconclusive debate, empirical evidences have been very contradicting. For example, a Catalunian circular labor migration is perhalps the most inferred kind of movement termed as the most successiful circular movement that has been used to justify the potential of circular labor migration (EMN, 2010; IOM, 2008, 2005). This was a cross-border circular labor migration involving two countries namely Spain and Columbia in which migrants were insisted and trained on the importance of investing at home. However, there have been several studies (Rodriguez, 2010; Chappell et al., 2010; EPC, 2010) suggesting that this is not always the case. A study by Rodriguez (2010) in philipine observed that circular labor migration did not result in a win but a loss to both migrants and their familes. Other studies in Jamaica, Ghana and Macedonia revealed that remittance and incentives from migration alone were not able to compensate for the impacts of labor force emigrating (Chappell et al., 2010). Such contradicting conclusion from empirical studies leaves questions on whether circular labor migration either contains both benefits and peril or whether it is a location specific aspect. Moreover, the specific win in wide dimensions of life has never been unveiled nor tested hence leaving a question such as, *"Does this win apply to every dimension of life?"* This calls for a test in several dimensions of life so as to arrive at a more refined and focused conclusion. In Lake Victoria Basin, circular labour migration has been a dominant practice among households (Drimie et al., 2009; Lounio, 2014; Msijaki, 2017). With the recurrent adverse climatic condition which adversely affects their livelihood, the situation has been intensified (Drimie et al., 2009; Lounio, 2014). However, there is a dearth of information regarding the implications that circular labour migration bears on food security. This study therefore intends to bridge this gap by assessing the implications of circular labor migration on food security in Lake Victoria Basin. Specifically, the study unveils the status of food security in the study area, examines the influence of circular labor migration on food security as well as the impact of the number of circular labor migrant in the household on food security status.

## MATERIALS AND METHODS

The study was conducted in two wards namely Kakukuru and Nyakabango wards of Ukerewe and Muleba District, respectively (Figure 1). The two districts are located along the shores of Lake-Victoria in which temporary circular labor migration is more evident (Lounio, 2014; Msijaki, 2017; Sospeter et al., 2017). The usual practice is households sending some members away for circular labor migration for meeting livelihood challenges. A total of 512 households being circular labor migrant[1] and non-circular labor migrant[2] households randomly sampled from the two wards were used. Sampling began by identifying a cluster of on-show wards from the two districts where circular labor migration is more prominent. Then, a ward from each district was randomly sampled. Then, from the two randomly sampled wards, two villages from each ward were selected randomly. Using the sampling frame collected from the Village Executive Officers of these villages, a total of 512 households were selected for interview. Methods of data collection were Household survey using questionnaire, Focus Group Discussion and Key informant interviews using Checklist. Data analysis was done using IBM SPSS. Techniques of data analysis including, chi-square, independent sample t-tests and paired sample T-Tests were used in the analysis (Appendix 1 to 4).

## RESULTS AND DISCUSSION

### Sample characteristics

A total of 512 households were used in this study of which 42.2% were circular labor migrant households while 57.8% were non-circular labour migrant households. Such high proportion (42.2%) of households involved in circular labor migration was expected in Lake Victoria Basin as the literature suggests that the highest flux of circular labour migrants is found among riparian communities in Lake Victoria zones (Drimie et al., 2009; Lounio, 2014). The analysis of the sex of heads circular labour migrant household revealed that male headed households are more circular labour migratory (88.4%) than female headed households (11.6%). According to Angula (2010), this scenario is attributed by the difference in copying strategies between males and females as when faced by shocks females are usually more flexible in adapting through engaging in a range of informal activities including basketry, nut processing, chicken rearing and many other informal works; while men prefer to move. Further investigation into the sex of circular labor migrants revealed the presence of more male circular labor migrants (89.6%) than female circular labor migrants (10.4%). Migration was more (73.8%) among young adults aged 18 to 44 years than any age category, hence tending to concur with earlier findings by

[1] A household which involves in circular labor migration
[2] A household which does not involve in circular labor migration

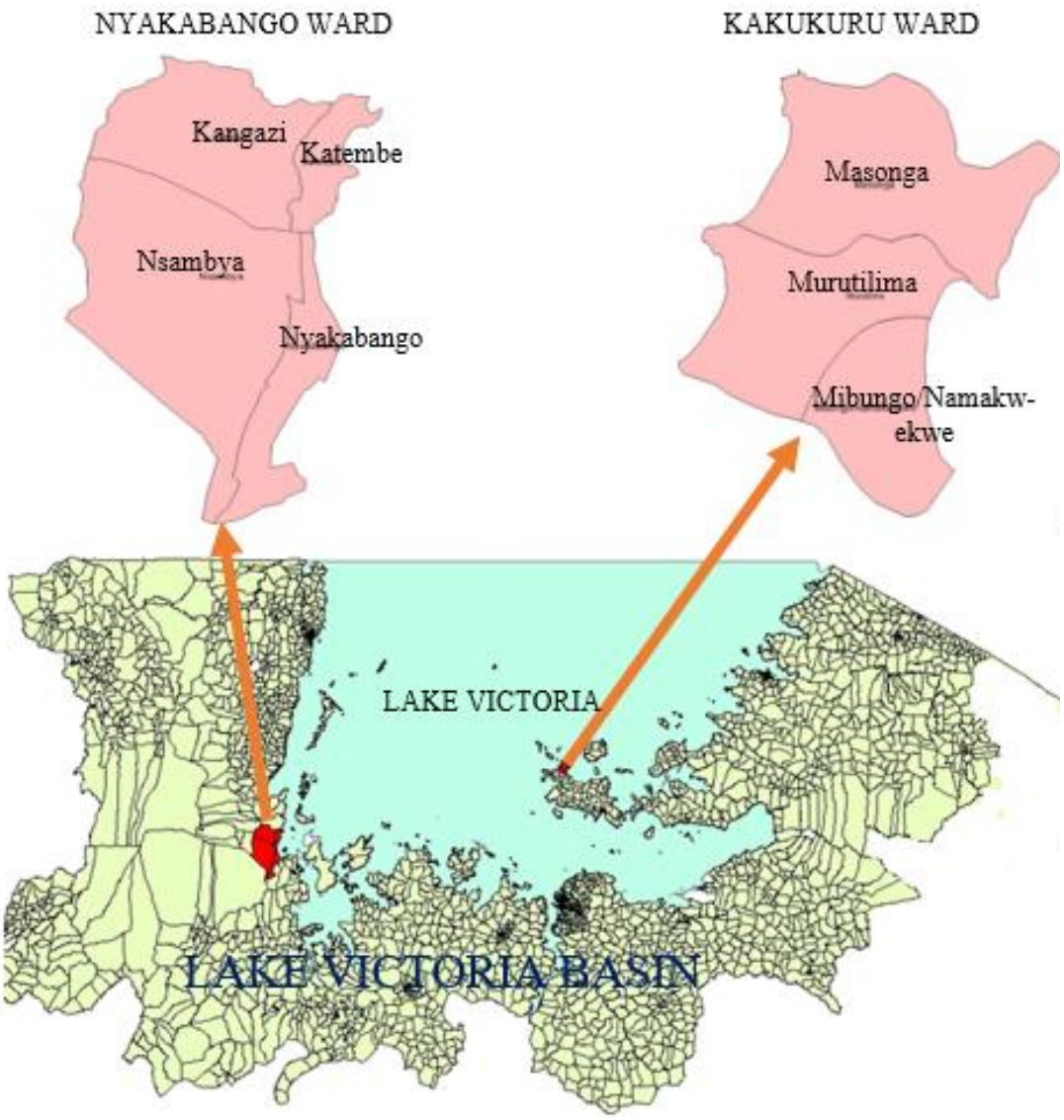


**Figure 1.** A map of Lake Victoria Basin showing the location of the study area.
Source: Authors

Collinson et al. (2006) and Bird and Deshingkar (2009) in South Africa and India, respectively (Table 1).

## Household food security status

### *Using HFIAS and HDDS measures*

Under the Household Food Insecurity Access Scales (HFIAS) measure, household respondents were asked to indicate their direct experience of food insecurity during the previous 30 days before the day of survey by responding to nine generic questions as suggested by Coates et al. (2007). The responses on these questions were recorded as; 0 if the household had never experienced food insecurity addressed by a specific question in the past 30 days; 1 if the household had rarely (once or twice) experienced food insecurity addressed by a specific generic question in the previous 30 days; '2' if the household had sometimes (three to ten times) experienced food insecurity addressed by a specific question in the 30 days and '3' if the household had often (more than ten times) experienced food insecurity addressed by a specific generic questions in the previous 30 days (Coates et al., 2007). Then, the scores for each household to all nine generic questions were summed up to obtain the total scores for each household (Coates et al., 2007; Massawe, 2016). On the other hand, under the Household Dietary Diversity Scale (HDDS) measure, household respondents were asked to recall the type of food, drinks or snacks that were eaten by any member in the household in the last 24 h before

**Table 1.** Sample characteristics.

| Variable | Kakukuru (Ukerewe) (%) | Nyakabango (Muleba) (%) | Overall (%) |
|---|---|---|---|
| **Household circular labour Migration Status** | | | |
| Non-circular labor migrant households | 168(55.3) | 128(61.5) | 296(57.8) |
| Circular labor migrant households | 136(44.7) | 80(38.5) | 216(42.2) |
| **Sex of the heads of circular labor migrant household** | | | |
| Male | 122(89.7) | 69 (86.3) | 191(88.4) |
| Female | 14(10.3) | 11(13.7) | 25(11.6) |
| **Sex of Circular Labor Migrants** | | | |
| Males | 147(89.1) | 68(90.7) | 215(89.6) |
| Females | 18(10.9) | 7(9.3) | 25(10.4) |
| **Age of circular labor migrants** | | | |
| Below 18 | 1(0.6) | 1(1.3) | 2(0.8) |
| 18-44 | 113(68.5) | 64(85.4) | 177(73.8) |
| 45-70 | 50(30.3) | 10(13.3) | 60(25) |
| 71 and above | 1(0.6) | 0(0) | 1(0.4) |

Source: Field Data (2020).

**Table 2.** Food security status by HDDS and HFIAS measures.

| Wards | HDDS measure | | | HFIAS measure | | |
|---|---|---|---|---|---|---|
| | N | Mean | Std error | N | Mean | Std error |
| Kakukuru (Ukerewe) | 304 | 3.4967 | 0.08017 | 304 | 12.454 | 0.47025 |
| Nyakabango (Muleba) | 208 | 3.5144 | 0.11073 | 208 | 8.2885 | 0.49950 |

Source: Field Data (2020).

the day of interview (Kennedy et al., 2011). The questionnaire used to collect this information contained 12 groups namely; Cereals; white tuber and roots; Vegetables[3]; Fruits[4]; Meat[5]; Eggs; Fish and other sea food; Legumes, Nuts and seeds; Milk and milk products; Oil and fats; Sweets; Spices, Condiments and Beverages (Kennedy et al., 2011; Swindale and Bilinsky, 2006). Only responses on food prepared at home and consumed either at home or outside home or food gathered or purchased outside and consumed at home were demanded from respondents as proposed by Food and Agriculture Organization (FAO) of the United Nations (Kennedy et al., 2011). The recording of responses was such that '0' if no food in a food group was not eaten and 1 if at least one food in the food group was eaten. Then, having obtained the scores for both HDDS and HFIAS, an independent sample t-test was carried out to compare the food security status across wards. Results (Table 2) indicated the existence of a non-statistically significant difference in Household Dietary Diversity Scores (HDDS) across studied wards (MD=-0.0177 T(405)=-0.130 P=0.897) and a statistically significant difference in Household Food Insecurity Access Scores(HFIAS) across studied wards (MD=4.1655 T(479)=6.072 P<0.01). As indicated in Table 2, the mean score in HDDS measure for Nyakabango was relatively high (Mean=3.5144) compared to Kakukuru (3.4967). However, the test statistics could not find it being statistically significant (T(510) =0.133; P=0.8) and that observed difference may have happened by chance (Fieds, 2009). On the other part, using the HFIAS measure, Kakukuru had a relatively higher scores (Mean=12.4539) on HFIAS measure than its counterpart Nyakabango (Mean=8.2885) and the test statistics (T(510) =5.927; P<0.01) revealed that the difference is statistically significant. Taking into account that in HFIAS measure, the food insecurity status worsens as scores increase (Coates et al., 2007), then this results imply that

[3] Includes Vitamin A rich vegetables and tubers, Dark green leafy vegetables and other vegetables.
[4] Includes Vitamin A rich fruits and other fruits like wild fruit and 100% fruit made from these fruits
[5] Include organic meat (e.g., liver, kidney heart etc.) and flesh meat (beef, pork, lamb, goat duck, chicken etc.)

**Table 3.** Food security status self-assessment.

| Wards | Food security status | | Total (%) |
|---|---|---|---|
| | Food secure (%) | Food insecure (%) | |
| Kakukuru (Ukerewe) | 97(31.9) | 207(68.1) | 304(100) |
| Nyakabango (Muleba) | 110(52.9) | 98(47.1) | 208(100) |
| Total | 207(40.4) | 305(59.6) | 512(100) |

Source: Field Data (2020).

Kakukuru is less privileged in terms of food access as compared to Nyakabango. The differences in food security status as measured by HDDS and HFIAS may be attributed by a geographical locational advantage where by Nyakabango is located in Kagera Region where the rain falls down almost twice a year (URT, 2019), hence, allowing investment in agriculture possible. On the other hand, Kakukuru is geographically located in tropical climate (URT, 2017) with unreliable rainfall which makes investment in agriculture a difficult undertaking.

### *By Household Food Security Self-Assessment (HFSSA)*

In recent years, there have been a rise in emphasizing the use of self-assessment as measures of household food security status (Headey, 2011, 2013). Several studies have found that food security status self-assessment measures correlate with other standard measures of food security status (Alisha et al., 2017; Maxwell et al., 2013). In this case, this study was also interested to examine the household food security status based on household food security self-assessment. Household respondents were asked to make their self-assessment on how they consider being the household's position in terms of food security status. Results (Table 3) indicate that there were more food insecure households (59.6%) compared to food secure households (40.4%) based on food insecurity status self-assessment. Further investigation revealed that the proportion of food insecure households was relatively high in Kakukuru (68.1%) compared to 47.1% of Nyakabango ward. This result correlates with the HFIAS finding in Table 2 in this study where Kakukuru was found to be less privileged in terms of food security and the difference could be attributed by the geographical locational differences.

## Influences of circular labor migration on food security

### *Using HDDS and HFIAS measure*

The independent sample t-tests were carried out to compare the status of food security between households involved in circular labor migration and those households not involved in circular labor migration. The results indicated in Table 4 revealed the existence of statistically significant difference in HDDS scores (MD= -0.39364; T(510)=-2.994 P=0.003;) and HFIAS scores (MD= 2.1424; T(510)=2.991 P=0.003 ) between household involved in circular labor migration and those not involved in circular labor migration. The eta squired ($\eta^2$) measure of magnitude of the difference for both measures were 0.02 indicating a small magnitude of the difference as per Cohen (1988). The results (Table 4) indicated that households involved in circular labor migration were better off in terms of food security status for both HDDS and HFIAS measures relative to those not involved in circular labor migration. This is indicated by the relatively higher HDDS mean scores (Mean=3.7315) for circular labor migrants than HDDS scores (Mean=3.3378) of non-circular labor migrant households as well as the low HFIAS[6] scores (Mean=9.5231) for circular labor migrants relative to the high HFIAS scores (Mean=11.6666) for non-circular labor migrants. Further analysis of area specific results (Table 5) indicated a similar results in Kakukuru for both HDDS measures (MD=-0.45833 T(302)=-2.877 P=0.004) and HFIAS measure (MD=3.34944 T(270)=3.561 P<0.01). In Nyakabango, although the mean score for household involved in circular labor migration is better for both HDDS (Mean=3.7) and HFIAS measure (Mean=7.6875) relative to that of non-circular labor migrant households, however, the test statistics was only statistically significant different for HDDS measure (MD=-0.30156 T(206)=-1.327 p=0.186) and HFIAS measure (MD=0.97656 T(206)= 0.951, P=0.343). Such difference possibly emanates from the fact that food insecurity crisis varies between Kakukuru and Nyakabango with a relatively worsen situation in Kakukuru as compared to Nyakabango (Table 5) and that possibly it could be because of this fact that Nyakabango did not take trouble to invest much of the return from circular labor migration for improving food security. The fact that food security scores are high for household involved in circular labor migration than households not involved in circular labor migration (table 4 and 5 above) implies that circular labor migration

[6] In HFIAS, food security status worsen as the scores increases

**Table 4.** Roles of circular labour migration on food security (HDDS and HFIAS measures).

| Household migration status | HDDS measure | | | HFIAS measure | | |
|---|---|---|---|---|---|---|
| | N | Mean | Std error | N | Mean | Std error |
| Non circular labor migrant | 296 | 3.3378 | 0.0792 | 296 | 11.6666 | 0.4565 |
| Circular labor migrant | 216 | 3.7315 | 0.1091 | 216 | 9.5231 | 0.5585 |

Source: Field Data (2020).

**Table 5.** Roles of circular labour migration on food security (locational specific results).

| Household migration status | HDDS measure | | | HFIAS measure | | |
|---|---|---|---|---|---|---|
| | N | Mean | Std error | N | Mean | Std error |
| **Kakukuru (Ukerewe)** | | | | | | |
| Non circular labor migrant | 168 | 3.2917 | 0.0986 | 168 | 13.9524 | 0.5817 |
| Circular labor migrant | 136 | 3.7500 | 0.1286 | 136 | 10.6029 | 0.7392 |
| **Nyakabago (Muleba)** | | | | | | |
| Non circular labor migrant | 128 | 3.3984 | 0.1210 | 128 | 8.6641 | 0.6407 |
| Circular labor migrant | 80 | 3.7000 | 0.1984 | 80 | 7.6875 | 0.7979 |

Source: Field Data (2020).

**Table 6.** Circular labor migration and household food security self-assessment.

| Household migration status | Food secure (%) | Food insecure (%) | Total (%) |
|---|---|---|---|
| Non circular labor migrant | 102(49.3) | 194(63.6) | 296(57.8) |
| Circular labor migrant | 105(50.7) | 111(36.4) | 216 (42.2) |
| Total | 207(100) | 305(100) | 512(100) |

Chi square=10.384, P=0.001; Exp(β)=1.7
Source: Field Data (2020).

plays a significant role in food security. This is possibly due to food items, food grains and other food staffs that were brought or sent back to households by circular labor migrants. This fact probably explains why some households keep on engaging in circular labor migration. Earlier findings by Lacroix (2013) also confirmed similar results. On his report following a study conducted in eight countries namely *India, Jamaica, Kenya, Sri Lanka, St Vincent, Grenadines, Tonga and Jamaica* (Lacroix, 2013) observed that migration improved food security of migrating households. This report associates the improved food security as a result of various forms of remittance sent by migrants to their home households that exerts a positive productivity on migrants' household farms. However, the link between farm productivity and remittance was not ascertained by this study because it was out of its focus, hence opening a new room for more research to ascertain the link between farm productivity and remittance. A study by Ratha et al. (2011) observed that migrants household in rural areas usually spend a significant proportion of remittance among others in improving farm and agricultural equipment. This might also have contributed to a better position as far as food security is concerned.

### *By Household Food Security Self-Assessment (HFSSA) measure*

The role of circular labor migration on food security was also examined using the Household Food Security Self-assessment measure of food security status. Household respondents were asked to provide their views on what they consider to be the position of their household in terms of food security. Then, a cross tabulation and a chi square test were carried out to examine the variation of food security status among circular and non-circular labor migrants based on self-rated assessment. Results (Table 6) indicate that there are more food insecure households (63.6%) among household who do not involve in circular

**Table 7.** Roles of circular labour migration on food security self-assessment (location specific results).

| Household migration status | Food secure (%) | Food insecure (%) | Total (%) |
|---|---|---|---|
| **Kakukuru (Ukerewe)** | | | |
| Non circular labor migrant | 37(38.1) | 131(63.3) | 168(55.3) |
| Circular labor migrant | 60(61.9) | 76(36.7) | 136(44.7) |
| **Nyakabango (Muleba)** | | | |
| Non circular labor migrant | 65(59.1) | 63(64.3) | 128(61.5) |
| Circular labor migrant | 45(40.9) | 35(35.7) | 80(38.5) |

Source: Field Data (2020).

**Table 8.** Roles of numbers of circular labour migrants on food security.

| Number of circular labor migrants | HDDS measure | | | HFIAS measure | | |
|---|---|---|---|---|---|---|
| | N | Means | Std error | N | Means | Std error |
| 1 | 127 | 3.630 | 0.13360 | 127 | 10.6220 | 0.75889 |
| 2 | 59 | 4.254 | 0.23760 | 59 | 7.5085 | 0.99130 |
| 3 | 15 | 3.267 | 0.40786 | 15 | 7.6667 | 1.11495 |
| 4 | 10 | 3.100 | 0.27689 | 10 | 7.3000 | 1.42244 |
| 5 | 5 | 2.800 | 0.37417 | 5 | 15.4000 | 1.42074 |

Source: Field Data (2020).

labor migration than it is among households which involve in circular labor migration (36.4). The Pearson chi square results ($\chi^2(1)=10.384$ p=0.001) indicated that there was a statistically significant association between involvement in circular labor migration and food security status. Furthermore, based on Fields (2009), the likelihood (odds) of non-labour migrant household to be food insecure (Exp(β)) was calculated and it was 1.7 indicating that the likelihood of non-circular labor migrants being food insecure was 1.7 times that of circular labor migrant households. This implies that, household which do not involve in circular labor migration in the study area are more likely to experience food insecurity than household that involve in circular labor migration.

The area specific results (Table 7) indicate similar results in Kakukuru (Chi square=10.384 P=0.001) where there was more proportion of food insecure household (63.3%) among households which do not involve in circular labor migration than it is among households which involve in circular labor migration (36.7). In Nyakabango, although the proportion of food insecure household was relatively high (64.3%) among households which do not involve in circular labor migration than it was for households that involve in circular labor migration (35.7%), the test statistics did not find a statistically significant association between food security status and involvement in circular labor migration (Chi square= 0.591 p=0.442). This is because, the proportion of food secure households was also high among households which do not involve in circular labor migration (59.1%) and thus could have balanced the results.

Having a high proportion of food insecure households among household which do not involve in circular labor migration relative to those households that involve in circular labor migration confirms the results obtained earlier in Tables 6 and 7 in this study as well as earlier finding by Lacroix (2013) and Ratha et al. (2011) who observed that migration improves food security.

## Impacts of number of circular labor migrants in food security

The impact of the number of circular labor migrants the house household is having on food security dimension was also investigated. The assumption here was that, if circular labor migration is potential, then food security status could increase with the increase of the number of circular labor migrants. In this case, One-Way Analysis of Variance (ANOVA) was performed to determine whether the mean score of both HDDS and HFIAS varied across number of circular labor migrants in the household. The ANOVA trend analysis was also performed to determine the trend of the food security score against number of circular labor migrants. Results presented in Table 8 revealed the existence of statistically significant difference in means of food security scores across

number of circular labor migrants for both household dietary diversity (HDDS) measure (F(4,211)=2.923, P=0.022) and Household food insecurity access scale (HFIAS) measure (F(4,211)=2.545, P=0.041). The omega squared ($\omega^2$) measure of the effect size was 0.034 and 0.028 for HDDS and HFIAS respectively indicating that the effect was of small magnitude (Kirk, 1996). Further analysis of the trend revealed the existence of a significant quadratic trend for both HDDS measures (F(1,211)= 6.234 p=0.013) and HFIAS measure (F(1,211)= 8.226 P=0.005) across number of circular labor migrants. The results indicated in Table 8 shows that, as the number of circular labor migrants the household is having increases, food security status improves for both measures. This indicates that the number of circular labor migrants enhances increased household food security. This is shown by the increasing HDDS scores and decreasing HFIAS scores. The scores in HFIAS have a declining trend due to the fact that, in HFIAS measure, food security status improves as the scores decreases. This possibly supports earlier finding in this study (Tables 4 to 7) and earlier findings by Lacroix (2013) that migration improves food security. Furthermore, the trend analysis revealed the existence a quadratic trend implying that although increase in number of circular labor migrant enhanced increased food security, further increase in circular labor migrant under the current working environment may exert a negative impact on food security. For HDDS measure, 2 circular labour migrants seem to produce optimal score while for HFIAS, four circular labor migrants may still produce optimal score. Generally, two circular labor migrants perform better in terms of food security than any other number of circular labor migrant.

## CONCLUSION AND RECOMMENDATION

Food security is a contextual and locational specific aspect and varies across localities. Households' involvement in circular labor migration improves food security status of the household but the extent of improvement varied across localities. Food security status improved as the number of circular labor migrants increased but it had a declining trend beyond 2 and 4 for both HDDS and HFIAS measures, respectively. Based on the findings it is recommended that, circular labor migrants should be encouraged to invest their return from circular labor migration in improving households' food security. The number of household members involved in circular labor migration should be controlled if the current work environment continues to exist. Scholars should consider the contextual and locational differences when looking into food security.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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## APPENDIX 1.

**Household survey questionnaire**

Hi. My name is ……from IRDP. I am doing a research on Circular Labour migration and livelihood in this area. Your household is among the household selected for this interview. Please, I would like to know if you are willing to participate in this interview

1= Agreed ☐ 2=Did not agree ☐

**A. Respondent characteristics.**

| Variable | Options (Please fill in or choose the correct response) | Responses |
|---|---|---|
| HH number | | |
| Ward name | 1= Kakukuru<br>2=Nyakabango | |
| Village name | 1=Masonga<br>2=Murutilima<br>3=Nyakabango<br>4=Nsambya | |
| Name of hamlet | | |
| Location of the household | 1=On show<br>2=Off show | |
| Please indicate the respondents | 1=Household head<br>2=household head partner<br>3= other | |
| Age of household head | | |
| Sex of household head | 1=Male<br>2=Female | |
| Marital status of household head | 1=Married<br>2=Single<br>3=Living together<br>4=Separated<br>5=widowed/widower<br>6=divorced | |
| Marital type | 1 =monogamy<br>2= polygamy | |
| Household size | | |
| Number of female household members | | |
| Number of male household members | | |
| Number of people who are able to work in the household | | |
| Number of people who are able to read and write | | |
| Number of people in the household with education higher than primary education | | |
| Highest education level reached by the household head | 1=No formal Education<br>2=Primary<br>3=Secondary (O-level)<br>4=Secondary (A-level)<br>5= College (non-higher learning)<br>6=University and other higher learning institutions | |
| Number of years spent in school from primary school to the highest level by the household head | | |
| Main occupation | 1=None (house wife with no job) 2=Government employee<br>3= Employed by a private company<br>4= Self-employed working far from household compound<br>5=Self-employed and work place near the household compound | |
| Average Household monthly income | | |
| Who is the main bread winner for this household? | 1=father<br>2=Mother<br>3=Both mother and father<br>4=other | |
| Household Land size in acres | | |

**B: Information on housing and assets.**

| Variable code | Question (Please provide the correct response among the options given) | Response |
|---|---|---|
| Who is the owner of the dwelling of the house you are living? | 1=Our household<br>2= Some other private owner<br>3=State or local authority | |
| Walling material of the main house | 1=Wood<br>2=Metal sheeting<br>3=Brick (fired/burned<br>4= Mad and straw<br>5=Stone and mortar<br>6= Brick (Mud and earth)<br>7= Cement brocks<br>8= Reinforced concreate 9=other | |
| Roofing material of the main house | 1=Metal sheeting<br>2=Straw or reeds<br>3=Roofing shingles<br>4=Cement or concrete<br>5=Thin plastic or fabric<br>6= Other | |
| The floor materials of the main house | 1=Earth floor<br>2=Cemented floor<br>3=Tiled floor<br>4=Other | |
| Type of the toilet used by the household | 1=None (open defecation)<br>2: None (we use Neighbors toilet)<br>3= Open pit<br>4=Enclosed pit (non-ventilated) 5=enclosed improved-ventilation pit<br>6=enclosed pour flush<br>7=enclosed flush 8=compost or biogas | |
| Main source of lighting used by the household | 1=liquid fuel (Petrol, kerosene)<br>2=Stable voltage electricity from national Grid<br>3=Electricity from solar panel, wind turbine or small dam<br>4= Electricity from generator<br>5=Gas fuel<br>6= Candle, paraffin wax<br>7=Battery powered torch<br>8=Solar powered torch<br>9= Firewood<br>10=Other | |
| Main source of cooking fuel | 1= Wood, saw dust, grass or other natural materials<br>2=Liquid fuel (petrol or kerosene)<br>3=Gas fuel Stable voltage electricity from national grid<br>4=Electricity from solar panel 5=Electricity from generator<br>6=Other | |
| What is the main source of water used by this household? | 1=piped water inside the house<br>2= pipped outside the house<br>3=piped water from the neighboring household<br>4= water purchased from water vendors | |
| What is the ratio of people per bed | | |
| What is the ratio of people per net | | |
| **Please indicate if the household is owning the following assets (use √ or X)** | | |
| TV | | |

**B: Information on housing and assets Cont'd.**

| | |
|---|---|
| Car | |
| Motor cycle | |
| Sewing machine | |
| Radio | |
| fishnet | |
| Fridge | |
| Gas cooker | |
| Milling Machine | |
| Sofa set | |
| Fishing boat | |
| Cows | |
| Goats | |
| Table | |
| Mobile phone | |
| **Social assets** | 0=No<br>1=Yes |
| Does this household attend church or mosque | |
| Does any household member play in any social group | |
| Are there any household member participating in any community group | |
| **Financial assets** | |
| Is there any household member who is having membership in any financial institution (such as Bank, saccoss etc | 0=No<br>1=Yes |
| Is there any member in the household who is having any financial saving at any financial institution (Bank or Saccoss)? | 0=No<br>1=Yes |
| Taking the amount saved by each household member, what is the total amount of saving | 0=No<br>1=Yes |
| Please indicate the amount of income for your household in the previous month | 0=No<br>1=Yes |

**C: Information on Circular Labour Migration.**

| Code | Please explain or choose the right response | Response |
|---|---|---|
| Does this household engage in circular Labour migration? | **0=No 1= Yes** | |
| How long have you been involved in this livelihood strategy? | | |
| How many people from this household have been involved in this livelihood strategy? | | |
| Please, indicate the number of males circular Labour migrants | | |
| Indicate the female circular labour migrants | | |
| Following your involvement in circular Labour migration from day one, could you remember the cost you have incurred so far in sending circular Labour migrants away? | 1= No I don't remember<br>2= Yes, but with difficult<br>3= Yes. without any difficult | |
| What have been the nature cost you have incurred so far in sending Circular Labour migrant away | **S/N** **Nature of cost (Please Tick √)**<br>1 Monetary cost<br>2 Cost of materials<br>3 Cost of food<br>4 Transport cost<br>5 Other cost<br>Gland total | Local market value |

**C: Information on Circular Labour Migration Cont'd.**

If someone else could be hired to perform the usual duty of all circular labour migrants for all the time of their absence, how could it cost the household at a local market price?

Following your involvement in circular Labour migration, could you remember the gains from circular Labour migration

1= No I don't remember
2= Yes, but with difficult
3= Yes. without any difficult
4=no but I can remember the achievement only

What have been the nature of gains from circular Labour migration from day one of your involvement

| S/N | Nature of gain (Please Tick √) | Local market value |
|---|---|---|
| 1 | Monetary | |
| 2 | Food | |
| 3 | Cloth | |
| 4 | Fishes (kitoweo) | |
| 5 | Other(mention) | |
| | Gland total | |

What else have you achieved so far from involvement in circular Labour migration

| S/N | Nature of gain (Please Tick √) | Local market value |
|---|---|---|
| 1 | None | |
| 2 | Paying a bride price | |
| 3 | Sending children to school | |
| 4 | Supplying important necessities to my household | |
| 5 | Building a house | |
| 6 | Other | |
| | Gland total | |

**D: Information on circular labour migration in the past 12 months.**

**In the past 12 months, have there been any member who are involved in circular Labour migration? 1= yes; 2=No**

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Please indicate the name of household members who have been involved in circular Labour migration for the past 12 moths | | | | | | |
| Sex:1= Male; 2=Female | | | | | | |
| Age (in years) | | | | | | |
| What is the usual destination place | | | | | | |
| Average distance to most typical destination place | | | | | | |
| On average, using the most common type of transport facility used, how long (in hours) does it take to rich to usual migration destination | | | | | | |
| Duration of stay at destination (Use the typical occasions) | | | | | | |
| What monetary cost did the household incur in sending circular Labour migrant away | | | | | | |

What other kind of materials was given to on the day of travelling

| | Material given (Please Tick √) | Insert local market Values if purchased at local market 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1 | Food | | | | | | |
| 2 | Cloth | | | | | | |
| 3 | Flour | | | | | | |
| 4 | Firewood | | | | | | |
| 5 | Charcoal | | | | | | |
| 6 | Other (state) | | | | | | |
| | Total | | | | | | |

If the household could hire someone to perform the usual work of …… at the household, how could it cost per year at the local market price?

**D: Information on circular labour migration in the past 12 months Cont'd.**

Was the decision to migrate by his/her own or household decision: 1=Own 2=Household

What were the reasons for migration of …..

1= Food shortage

2= Income insufficiency

3= Getting money for paying bride price

4= Prestige

5= Wealth accumulation

6=Other (Mention)

How frequently does return home after migration?

1= less frequently

3= Frequently

4= More frequently

To what extent does communicate to this household while away?

1=Never

2= less frequently

3= Frequently

4= More frequently

What is the means of communication that usually use to communicate to this household

1= Own mobile phone

2= Friends mobile phone

2= Letter

4=Send his/her co-worker

5= other

Does send remittance to this household?

1= No 2=Yes

What is the nature of remittances

| | **Nature of remittance** | **(Tick √ )** | Insert the value of remittance sent by each 1 2 3 4 5 6 |
|---|---|---|---|
| 1 | Money | | |
| 2 | Food | | |
| 3 | Kitowewo (Mboga) | | |
| 4 | Skills | | |
| 5 | Ideas | | |
| 6 | Other | | |
| | Total | | |

Skills acquired from circular Labour Migrant is One of the important kind of remittance from migration if only they are required and used by the household. For your household, have there been any kind of skills from migration that have been helpful to this household?

1=Yes 2= No

What kind of skill remittances from …that has been used by this household?

In what ways did the skills acquired by…. helped the household?

If someone else who has the same skill is hired to provide such skills, how could it cost the household to pay for him/her?

Do you think the gain you receive from circular labour migration from …. is able to counteract the cost of his absence?

0=absolutely no

1=absolutely yes

2=Not sure

What is the reason for your answer

What is the nature of job that perform in migration by…?

1=Self employed

2=Employed by private entity

**D: Information on circular labour migration in the past 12 months Cont'd.**

What is a specific job that usually performs in his/her migration undertaking?
1= Fishing
2= Net making
3= Boat making
4= Cooking
5= Food vending
6=Lodge worker
7= Restaurant worker
9= Other
Does …have any formal or informal job contract
1= No
2= Have informal contract
3= Have formal contract
Does .. reported any cases of his/her rights denial?
What kinds of rights denial reported by …
How is wage payment term?
1= Daily
2= Weekly
3= Monthly
4= Unpredictable
What is the usual pay (Earning) per month
Is there any unfavorable condition on job contract that you think creates imbalances?
1= Yes 2= No
If yes, what are those unfavourable terms on the job contract
Has reported any unfavourable event or changes that adversely affect his/her migration undertaking?
1= Yes 2= No
What are Specific unfavorable changes reported by……
What are circumstances that face that hinder his/her achievement in his/her migration undertaking?
1= Poor capital
2= Unequal bargaining between employer and employee
3= Employer exploitation
4= Low pay
5= Government procedures
6= Taxa Regulations
7= Low earning
7=Large investors monopoly
8=Climatic variation
9=Unpredictable earning
Seasonality of harvest
other

**E: Household food insecurity access scales.**

| Variable code | Variable (Please fill in or choose the correct response) | Responses |
|---|---|---|
| In the past four weeks, did you worry that your household would not have enough food? | 1= No<br>2=Yes | |
| How often did this happen? | 1= Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) | |

**E: Contd.**

| | |
|---|---|
| In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? | 1= No<br>2=Yes |
| How often did this happen? | 1= Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |
| In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources | 1=No<br>2=Yes |
| How often did this happen | 1=Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |
| In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? | 1=No<br>2=Yes |
| How often did this happen? | 1=Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |
| In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food? | 1=No<br>2=Yes |
| How often did this happen? | 1=Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |
| In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food? | 1=No<br>2=Yes |
| How often did this happen? | 1=Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |
| In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food | 1=No<br>2=Yes |
| How often did this happen? | 1=Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |
| In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food? | 1=No<br>2=Yes |
| How often did this happen? | 1=Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |

**E: Household food insecurity access scales cont'd.**

| | |
|---|---|
| In the past four weeks, did you or any household member go a whole day and night without eating anything because there was no enough food? | 1=No<br>2=Yes |
| How often did this happen? | 1=Rarely (once or twice in the past four weeks)<br>2=Sometimes (three to ten times in the past four weeks)<br>3=Often (more than ten times in the past four weeks) |
| How do you judge this household in terms of food security? | 1=food secure<br>2=Food insecure<br>3=Seriously food insecure |

**Household diatary diversity.**

| | |
|---|---|
| Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. foods consumed outside the home by any household member that were not prepared in the home should not be included. | **0=No**<br>**1=Yes** |
| Did this household ate any cereals food such as bread, rice noodles, biscuits, or any other foods made from millet, sorghum, maize, rice, wheat, etc. | |
| Did this household eat any food made from root or tuber food such as potatoes, yams, manioc, cassava yesterday etc. | |
| Did this household eat any vegetables yesterday? | |
| Did this household ate any fruits yesterday? | |
| Did this household ate any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, etc yesterday | |
| Did this household eat eggs yesterday | |
| Did this household eat any fresh fish, dried fish, shellfish or any other fish yesterday? | |
| Did this household eat any foods made from beans, peas, lentils, or nuts yesterday | |
| Did this household drink milk or eat any food made of milk and milk products such as cheese, yogurt etc. yesterday | |
| Did this household eat any foods made with oil, fat, or butter? | |
| Did this household eat sugarcane, sugar. sweets or honey yesterday | |
| Did this household ate any other foods, such as condiments, coffee, tea in the last 24 hours. | |

**APENDIX 2: Focus group discussion checklist.**

**Introduction**

Thank you for agreeing to participate. We are very interested to hear your valuable opinion on circular Labour migration and livelihood in this area.

**Instructions**

i) The purpose of this study is to understand the implication of circular Labour migration on livelihood.

ii) This discussion will take approximately one hour

iii) We will be taking documentation of the narration given but information you give us is completely confidential, and we will not associate your name with anything you say in the focus group. No names will be attached to these documentations.

iv) Make sure you register your name on the consent form

v) You may refuse to answer any question or withdraw from the study at any time.

**DISCUSSION QUESTIONS**

1. How is the general execution of circular Labour migration in this place

*Probes for discussion*

- Who moves
- Typical destination
- Migration motives
- Magnitude of move
- Historical operation of circular Labour migration
- Major events in operations

2. How is the livelihood status of this area

*Probes for discussion*

- Food status
- Housing
- General health status
- Safety and health
- *Cost of living*

3. How has circular Labour migration contributed to shaping the livelihood experienced by households in this community?

*Probes for discussion*

- Benefits/losses
- Nature of gains/losses
- Who gain/losses and in what
- Destination and origin benefit balances
- Work force loss in agriculture vs gains from migration

4. General working conditions at circular migrants destinations

*Probes for discussion*

- General working conditions
- Safety and Health protection
- Abuse issues on the job
- Access to supplies, equipment
- Respect/recognition from employers
- Opportunity, achievement,
- Work/home balance
- Regulations/policies/rules
- Technologies used
- Cultural adaptation

5. Can circular Labour migration be a perfect substitution of the circular Labour migrants absence in productive work at home and why?

**APENDIX 2: Focus group discussion checklist cont'd.**

- *Circular Labour migration monetary gains vs monetary costs*
- *Circular Labour migration non-monetary gains vs non-monetary costs*

6. What do you think could be done to make circular migration more profitable undertaking?
   - Policies
   - Regulations
   - Habits

**Conclusion.**

Thank you so much for coming and sharing your thoughts and opinions with us.

**APPENDIX 3**

**Key informant checklist.**

**Introduction**

Thank you for agreeing to participate. We are very interested to hear your valuable opinion on circular Labour migration and livelihood in this area following the fact that you are very familiar with its operation in this study area.

**Instructions**

i) The purpose of this study is to understand the implication of circular Labour migration on livelihood.
ii) This interview will take approximately 30 minutes
iii) I will be taking documentation of the narration given by you but information you give me is completely confidential, and i will not associate your name with anything you say in this interview. Your will not be attached to these documentations.
iv) You may refuse to answer any question or withdraw from the study at any time.

**DISCUSSION QUESTIONS**

1. You have lived in this area for a considerable period of time and you know very well about household involvement in circular Labour migration, in your own words how

   *Probes for interview*
   - Who moves
   - Typical destination
   - Migration motives
   - Magnitude of move

2. Can you tress the historical operation of circular Labour migration and major events and changes following this operations
3. On your experience with the operation of circular Labour migration how can you speak on circular migrants working conditions at circular migrants destinations

*Probes for discussion*
- General working conditions
- Safety and Health protection
- Abuse issues on the job
- Respect/recognition from employers
- Opportunity, achievement,
- Work/home balance
- Regulations/policies/rules
- Technologies used
- Payment terms
- Work contracts

4. On your opinion, can circular Labour migrants achieve a successful migration and why?

*Probes for interview*
- Benefits
- Nature of benefits
- Nature of gains or loss

5. On your opinion and considering the current operation of circular Labour migration. Do you think household participation in circular Labour migration is a perfect substitution of their absence in productive work at home and why?
   - *Circular Labour migration monetary gains vs monetary costs*
   - *Circular Labour migration non-monetary gains vs non-monetary costs*

**Conclusion.**

Thank you so much for coming and sharing your thoughts and opinions with me.

**APPENDIX 4**
**HDDS food group classification and description- a guide for interviewer.**

| | Food Groups | Description of food groups |
|---|---|---|
| 1. | Cereals | corn/maize, rice, wheat, sorghum, millet or any other grains or foods made from these (such as bread, noodles, porridge or other grain products) + insert local foods such as ugali, nshima, porridge or paste |
| 2. | White roots and tubers | white potatoes, white yam, white cassava, or other foods made from roots |
| 3. | Vegitables | **Vitamin-A Rich Vegetables and Tubers**<br>pumpkin, carrot, squash, or sweet potato that are orange inside + other locally available vitamin A rich vegetables (such as red sweet pepper<br>**Dark Green Leafy Vegetables**<br>dark green leafy vegetables, including wild forms + locally available vitamin A rich leaves such as amaranth, cassava leaves, kale, spinach<br>**Other Vegetables**<br>other vegetables (such as tomato, onion, eggplant) + other locally available vegetables |
| 4. | Fruits | **Vitamin-A Rich Fruits**<br>ripe mango, cantaloupe, apricot (fresh or dried), ripe papaya, dried peach, and 100% fruit juice made from these + other locally available vitamin A rich fruits<br>**Other fruits**<br>other fruits, including wild fruits and 100% fruit juice made from these |
| 5. | Meat | **Organ meat**<br>liver, kidney, heart or other organ meats or blood-based foods<br>**Flesh meats**<br>beef, pork, lamb, goat, rabbit, game, chicken, duck, other birds, insects |
| 6. | Egg | eggs from chicken, duck, guinea fowl or any other egg |
| 7. | Fish and other sea food | fresh or dried fish or shellfish |
| 8. | Legumes, nuts and seeds | dried beans, dried peas, lentils, nuts, seeds or foods made from these (eg. hummus, peanut butter) |
| 9. | Milk and milk products | milk, cheese, yogurt or other milk products |
| 10. | Oils and fats | oil, fats or butter added to food or used for cooking |
| 11. | Sweets | sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes |
| 12. | Spices, condiments and beverages | spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages |