

# ***Inclusiveness of Wage Employment and Determinants of Wage Incomes: Empirical Evidence from Large-Scale Farms in Ethiopia***

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## ***Abstract***

*Unemployment is one of the critical problems of developing countries, including Ethiopia. Agriculture is not only the mainstay of the economy of Ethiopia, but also a major contributor of employment opportunities for its citizens. The government of Ethiopia promotes commercialization of the agricultural sector through large-scale farming investment by the private sector. The article examined inclusiveness of large-scale farming and factors that determine wage incomes earned by plantation workers in Ethiopia. Both primary and secondary data were generated from households, and large-scale farming companies. Data were subjected to a modified Mincer's earnings function to see which group of the society benefited from wage employment. Inclusiveness in plantation agriculture in the form of wage employment was very limited to the local indigenous population in Gambella and Benshangul Gumuz regional states due to lack of prior farming experiences of the workers. Men and those with technical training received better incomes from wage employment. Regional variation in wage rates was observed among Oromia, Gambela and Benshangul Gumuz regional states due to harsh working environment and low availability of workforce. Inclusion of the local people in wage employment should receive attention by owners and the government, which will otherwise affect smooth and sustainable operation of the farms. Further, it calls for an intervention to enhance the technical skills of workers, and improve women's participation and earnings in plantation agriculture.*

**Keywords:** Plantation agriculture; wage employment; large-scale farms; inclusiveness; Mincer earning regression; Ethiopia

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## **Introduction**

The neoclassical economic theory explains that wages are determined by the marginal product of labor (Ehrenberg & Smith, 2009). Thus, in a market-led economy, the amount of wages received show strong correlation with productivity (Belser, 2013). Under perfect labor market condition where wage rates are determined by supply and demand forces, unemployment is considered as a voluntary individual decision as market determined wage rates are assumed to clear all available labor and meet all labor demands. On the other hand, a proposition presented by the famous Shapiro-Stiglitz unemployment model in 1984 provided a sound technical explanation as to why involuntary unemployment occurs and why nominal wage rates are higher than market clearing wages. The model explains that employers could pay wages higher than the market clearing wage rates due to fearing of shirking by the incumbent employees that will reduce the efficiency of firms. Job seekers fail

to convince employers that they can perform tasks at a lower wage rates than the equilibrium wage rate paid by employers as firms fear shirking behavior of job seekers once they are hired. This situation brings involuntary unemployment in the job market unlike what is postulated in the neoclassical economic theory (Shapiro & Stiglitz, 1984). In developing countries, labor markets are far from perfect due to various factors including asymmetric information resulting from low level of infrastructure development. Thus, they are characterized by missing and/or thin markets. As a result, unemployment tends to be involuntary. Therefore, the Shapiro-Stiglitz efficiency wage model sounds much better in explaining employment and wage rate conditions in developing countries where involuntary unemployment is the norm than the order.

Rising rate of unemployment has become a concern across the globe. The situation is worsened since the 2007/08 economic meltdown that hit many countries in the world. National governments in the developing south took policy measures to attract agricultural investment as a mechanism to create jobs to the youth. The World Bank report of *Rising Global Interest in Farmland* stated that large-scale agricultural investment contributes to poverty reduction through employment creation (Deininger *et al.*, 2011). Li (2011) challenged the World Bank's claim as unrealistic raising the argument that large-scale mechanized farms are labour-repealing than labour-absorbing reflecting the fact that such kind of business model is not inclusive of the local community. Inclusive business is a broad concept which describes the degree of involvement of the local community in investment projects as producers, suppliers, workers, distributors, and/or consumers (DCED, 2017). It promotes smallholders' integration into markets and thus it expands access of the poor to basic products and service. There are different business models – as in the case of contract farming, joint ventures, management/ventures, community leases, traders, farmer organizations, agrifood processors, retailers that link local communities' in the agricultural value chains as producers, suppliers, employees, shareholders and consumers (Kelly *et al.*, 2015). Studies on inclusive business models identified the principles, pillars and support schemes that business models should consider in improving inclusiveness of the local people (Kelly *et al.*, 2015; German *et al.*, 2018), assessed the mechanisms by which inclusive business models contribute to livelihood and food security of smallholder farmers (Hahn, 2012; Kelly *et al.*, 2015; Woodhill, 2016; Schouten & Vellema, 2019; Wangu *et al.*, 2020), explored the different types of business models and degree of inclusiveness of smallholder farmers (Vorley *et al.*, 2008; Bernard &

Spielman, 2009; Chamberlain & Anseeuw, 2019; Da Silva & Rankin, 2013) and assessed the caveats faced by enterprises while attempting to improve inclusion of local people along the value chain (Kelly *et al.*, 2015 & FAO, 2017).

Ethiopia is one of the top few countries in Africa that attracted investments in large-scale farming. Evidence presented by the Land Matrix (2020) showed that a total of 1.45 million ha of land was transferred to large-scale farming projects in Ethiopia between the period 2000 and 2020. An argument that is often put forward by the Ethiopian government in favour of large-scale farming is the employment it creates (MoFED, 2010). Studies on the contributions of large-scale farming in respect of employment generation are mixed. Lipton (1977) and De Schutter (2011) acknowledged that supporting the productivity of smallholder family-operated farming generates more employment than large-scale mechanized farming does. On the other hand, Cramer *et al.* (2008) in Mozambique indicated the positive welfare effects of plantation agriculture for the poor who have limited access to land, especially when the number of days that the poor are engaged in employment increases. Although large-scale plantation agriculture is criticized for limited inclusiveness due to adoption of mechanized farming techniques (Li, 2011), it can provide employment opportunities to the local community in the different stages of the production process. Previous studies not only provided mixed evidence as to whether large-scale farming positively contributes to job creation, but they offer little empirical evidence on issues of who benefited from wage employment opportunities (men or women; immigrants or local people, etc). That is to say, there is little evidence on the degree of inclusiveness of local people in wage employment disaggregated by gender and area of origin of the employees, and the determinants of wage incomes in Ethiopia.

Therefore, this study attempted to fill the existing knowledge gap by generating empirical evidence from Oromia, Gambella and Benshanguel Gumuz regional states.

### Context and Description of Study Area

Three regional states in Ethiopia, namely, Oromia, Benshanguel Gumuz and Gambella Regional States, were selected for two important reasons: (1) massive agricultural investment projects flowed to these regions and studying the contribution of the investments to employment generation in these regions will potentially help improve agricultural policies; and (2) the regions chosen have different population density, level of infrastructure development, market integration, local livelihood patterns, natural resource base, skilled and unskilled labor availability, etc.

Oromia regional state provides information on the impacts of large-scale agricultural investment in the highlands of Ethiopia. Its dense settlements are smallholder dominated and it enjoys a relatively better infrastructure and market integration, better availability of skilled and unskilled labor, and a statutory dominated land tenure system. While Oromia can be considered as a densely populated and smallholder dominated region, it is by no means representative of other highland regions of the country, and the aim here is to have an overview of the contributions of large-scale farming to employment generation when investment is made in the highlands and lowlands.

The other two regions (Gambella and Benshangul regional states) represent the lowland parts of the country where a customary land tenure system dominates with sparsely populated agro-pastoralist communities who practice small-scale crop production through shifting cultivation using hand and hoe. Availability of labor, infrastructure development and level of market integration is very low in these

regions, which will give us the opportunity to examine the contributions of investments to employment generation in these regions against those found in the highlands. While Oromia regional state represents the peasantry in the Center who are incorporated to the Ethiopian kingdom before the 19<sup>th</sup> Century, Gambella and Benshangul Gumuz regional states represent the peasantry in the periphery who are incorporated to the Kingdom only in the late 19<sup>th</sup> Century. Oromia region is characterized by smallholder farming with marked inequality in land ownership, better (road and market) infrastructure and overall regional development. The region is densely populated with high level of landlessness and land fragmentation. There is also a long history of wage labor employment by those farm households who are better off in terms of their land size and economic status.

On the other hand, Gambella and Benshangul regional states are characterized by poor road and market infrastructure and low level of overall regional economic development. The regions are sparsely populated and agro-pastoralism and small-scale crop production based on shifting cultivation and re-treat farming are the dominant livelihood systems. The people have limited experience in crop production and wage labour employment. Peasants from the Center with poor natural resource endowment and who have been frequently affected by drought are settled in this region some 30 years ago by the Derg government. The settlers have better experience in farming compared to the indigenous people. Interestingly, all the three regions are targeted by the present government for large-scale farming.

### Methodology

Four large-scale farms operating in the three regions described above were considered as case studies to see how they affected the wage labor market in these regions. All the case studies adopted a business model in

which the local people are incorporated as employees of the large-scale plantations. The large-scale farms chosen are based on the type of crop commodity and origin of investor. In Oromia regional state, Karuturi Agro Products PLC., a Bangalore-based Indian investor who cultivated maize on 11700 ha of land in the Bako plains of Bako Tibe district, is considered.

In Gambella regional state, two large-scale farms were chosen as case studies. Basen Agricultural and Industrial Development PLC., a domestic investor who is producing cotton on 10,000ha of land in Abobo district of Gambella regional state, served as one case. Basen operates in an area where settlers from northern and southern Ethiopia are living with some distance from the indigenous Anuak people.

In addition, Karuturi Agro Products PLC., which cultivated maize and sugarcane on its 100,000 ha land concession in Jikawo and Itang districts of the region served as the second case. While Itang district is inhabited by the Anuak, the Nuer inhabit Jikawo district of the region. In Benshangul Gumuz regional state, Shaporji (S & P Energy Solutions), an Indian investor who cultivated *Milletia pinnata* (locally called Pongomia – a tree used as raw material for the production of biofuel and food oil) on its 50,000ha land concession, served as a case. All of the four large-scale farms didn't cultivate their entire concession but employed some wage labor on permanent and casual basis.

The total number of employee population show variability, and it was difficult to estimate sample size using a statistical formula that requires total population. Hence, a sample size determination formula for unknown population with a confidence level of 90% ( $Z=1.64$ ), 0.5 standard deviation (S) and 5% error margin (E) was adopted following Cochran's (1977) formula, which is  $n = (ZS/E)^2$ .

Using this formula gives a sample size of 271, and adding a 10% allowance for a better precision, the sample size will be 300 employees. Thus, primary data were collected from 300 employees drawn through stratified and random sampling techniques who are working in the large-scale farms considered as case studies. Employees were stratified as 'machine operators', 'guards and maids' and 'other plantation workers'.

The sample size from each stratum was determined based on proportion to the size of the strata. Variables such as gender, age, area of origin (immigrant or indigenous), amount of wage/salary received, number of years of experience working in plantation agriculture, type of activity performed in the farm, level and type of skill training acquired, etc. were collected from the employees.

In addition, secondary data were collected from large-scale farms on employee's record such as number of casual and permanent employees recruited, size of land cultivated, salary/wage paid, major challenges farms encountered, income tax paid, etc.

Quantitative data were generated using survey method. Data were subjected to quantitative methods of data analysis. More specifically, a Mincer-type earning function was adopted in the analysis of the determinants of wage rate in plantation monoculture in Ethiopia. The Mincer earning regression is widely used in the conceptualization and operationalization of factors earnings.

It stipulates the statistical relationship between market wage rates, years of schooling and experience (Mincer, 1958). Mathematically, the original Mincer function is presented as follows:

$$\ln Y_i = a_0 + a_1 S_i + a_2 t_i + a_3 t_i^2 + \epsilon$$

Where the left-hand side ( $\ln Y_i$ ) is observed earning,  $a_0$  is the initial earning capacity of the employee without schooling and experience,  $a_1$  is the rate of return to education,  $a_2$  (coefficient for experience) and  $a_3$  (coefficient for experience squared) are the rate of return to on-the-job training.

One universal characteristics of the Mincer's earning function is the concavity of earnings function in which the coefficient for experience squared is expected to be negative. This is to mean that for individuals who are continuously attached to the labor market, their earnings rise at a decreasing rate throughout their life cycle. Mincer suggested a log-linear functional form, which was criticized by other researchers.

For example, Thurow employed a log-log model assuming that earnings are produced by a Cobb Douglas production function (Thurow, 1969). Heckman and Polachek (1974) used Box-Cox and Box-Tidwell models to test the appropriate functional form. Their findings suggested that the Mincer's log-linear specification fitted their data best. In 1974, Mincer relaxed the constraint that log earnings increase linearly with schooling and the constraint that log earnings experience profiles are parallel across schooling classes by adding an interaction term between experience and schooling (Mincer, 1974). The Mincer earnings function implies that the more human capital investments an individual makes, the higher his or her earnings. Polachek (2007) argued that this happens in a competitive labor markets that reward employees based on their years of schooling, quality of their education and when the market rewards productivity of laborers. This is problematic particularly in wage employment in Ethiopia where labor markets are not competitive, and enough jobs may not be available for wage-workers with several years of schooling. Therefore, interpretation of the results should be done cautiously.

Although Mincer's earning function postulate the functional relationship between earnings and investment in schooling and on-the-job training (work experience), human capital theory explains that other demographic and socioeconomic variables are also important in explaining wage differences among different groups of workers in the labor market (Polachek, 2007). As a result, labor economists estimate Mincer-type earning functions by including variables such as gender, race, and ethnic background, geographic location, occupational type, health status, marital status, age (to capture child labor abuse), union membership, etc. to estimate discrimination against a specific group of population that has relevant policy implications (Gronau, 1988; Mellor & Paulin, 1995; Cline, 2001; Hirsch, 2007).

Based on the information generated during the exploratory survey, we extended Mincer's postulation by including other variables that are important determinants of wage incomes in plantation agriculture. This includes, but is not limited to: origin of wage-worker, location of the large-scale farm, crop type cultivated by the large-scale farm, type of wage work performed and characteristics of employee (sex, age, area of origin, experience in plantation agriculture, skill and level of training, etc). The data generated from employees' survey were then subjected to Mincer-type log-linear regression to identify the determinants of different wages among wage-workers. The analysis is carried out with the aim of identifying which group of the population has benefited from wage employment in plantation agriculture, which has the

potential to pinpoint the winners from wage employment. The study presented the following hypothesis based on literature and observations from the exploratory survey. See below the variables along with expected signs.

Table 1: Variables and expected signs

Variables	Measurement	Expected signs
Age of the employee	Years	-
Sex of the employee	Dummy, 0 if female and 1 if male	+
Years of farming experience	Years	+
Education level (Years)	Years	+
Origin of employee	Dummy, 0 if immigrant and 1 if indigenous	-
Type of work	Dummy, 0 if manual and 1 if technical	+
Location of the farm	Dummy, 0 if highland and 1 lowland	+
Type of crop	Dummy, 0 if food crop and 1 industry crop	+

generating additional employment for the needy, and thus only a small number of jobs (0.08–0.22 jobs per ha) have been created despite it being a non-food crop (Table 1). At present, the company generated some jobs by cultivating food crops such as maize, sesame and pigeon pea, in addition to planting the

## Results and Discussion

### Contributions of Large-Scale Farming to Employment Generation in Ethiopia

The number of jobs generated from each hectare of land show variation among the cases of this study. This is so because of the level of mechanization put in place and the type of crop commodity produced by the companies. In general, the farms generated 0.08–0.28 jobs per ha during slack seasons, and 0.13–0.38 jobs per ha during peak seasons. Cultivation of non-food crops by Basen Farm (e.g. cotton) generated more jobs (0.28–0.38 jobs per ha) than production of food crops by Karuturi (0.09–0.13 jobs per ha in Karuturi-Oromia and 0.15–0.23 jobs per ha in Karuturi-Gambella). This is consistently true both during off and peak farming seasons. Apart from ploughing and planting, most of the farm activities at Basen farm are carried out with manual labor. Especially cotton harvesting is the most labor-demanding and most paying activity compared to other activities performed by the wagers in the Basen farm. In the case of S&P, once the *Milletia pinnata* is planted, there is very little opportunity of

biofuel tree. In the case of Karuturi, there is a relatively high use of mechanization for the different farming activities such as cultivation, planting, spraying herbicides and harvesting. In Gambella, Karuturi used a combine harvester to do the first harvesting and manual labor for the second harvesting of maize stock skipped by the harvester due to short height. The use of mechanization and the cultivation of food crop (maize) were the reasons for the small number of jobs generated per ha by Karuturi compared to Basen farm.

A study by Deininger *et al.* (2011) in Ethiopia showed that plantation agriculture generated 0.005 jobs per ha, which is significantly lower than the findings of this study, probably due to the aggregation of data collected from all large-scale farms that cultivated different types of crops (food and non-food) and employed different levels of mechanization. The definitions of large-scale farming used by the different studies cited here is mixed and sometimes not clear. For instance, Deininger *et al.* (2011) used scale of 500 ha and above to the definition of large-scale farms. Others like Cramer *et al.* (2014) defined large-scale farms based on the

Table 2: Employment Generation from Large-Scale Farms in Ethiopia (2016)

We further analyzed the average wage rate paid by different companies. As expected,

Table 2: Employment Generation from Large-Scale Farms in Ethiopia (2016)

Variables	Large-scale farm			
	Karuturi (Oromia)	Karuturi (Gambella)	Basen (Gambella)	S&P (Benshanguel)
Number of wage jobs per year	200–300	600–1000	234–564	200–700
Going daily wage rate (ETB)	12	35	36	39
Number of permanent jobs	43–50	133	23–69	81
Number of jobs created per ha	0.09–0.13	0.15–0.23	0.28–0.38	0.08–0.22
% of immigrant labour	0%	76%	92%	93.8%
Proportion of women employee	58%	34%	36%	35.9%
Mean age of wagers	22.1	26.6	24.4	25.5
Mean education (Years)	6.3	7.8	8.3	9.5
Mean wage income in ETB/day	13.5	46.2	92.4	57.6
(Mean wage income in US\$/day)	(0.35)	(1.21)	(2.43)	(1.51)
Wagers with previous experience	14%	32%	50%	22%

Source: Authors' own computations-based survey data

number of workers. Therefore care should be taken in taking up the citations. Studies in other countries also indicated that it has generated 0.014 jobs per ha in Brazil (FAO, 2012a), 0.351 jobs per ha in the Democratic Republic of Congo (Deininger *et al.*, 2011), and 0.006 jobs per ha in Madagascar (Andrianirina-Ratsialonana & Teysier, 2010), which are lower than the Ethiopian case. FAO (2012b) reported that plantation agriculture in Ghana and Uganda demonstrated a positive and significant contribution to the number of jobs generated for local people but these were not sustainable as companies replaced labor-intensive work with capital-intensive technology over time. In addition, the wages remained low. Although this study did not compare smallholder farming with large-scale farming, smallholder farming is contended to generate comparatively more jobs per ha than large-scale farming (FAO, 2012a). The impact of large-scale land acquisition on income generation through employment increases if there is a linkage between large-scale and small-scale farms through contract farming, as is the case in Ghana (Vath & Kirk, 2011).

there are differences in the average daily wage rates paid by the large-scale farms operating in the different regional states in the country. The location factor is found to be an important determinant in this regard. In Bako Tibe district (Oromia regional state) where landlessness is very high, labor availability is relatively better. Corollary to this, the average wage rate paid to wagers (ETB 13.5 or **US\$0.35**) is relatively lower than the average wage rates paid in Gambella (ETB 46.2–92.4 or **US\$1.21–2.43**) and Benshangul Gumuz regional states (ETB 57.6 or **US\$1.51**) (Table 2). (ETB stands for Ethiopian Birr, which is the currency unit of the Federal Democratic Republic of Ethiopia.) In Bako Tibe district, Karuturi pays a minimum daily wage of ETB 12 (**US\$ 0.32**) for manual jobs and a maximum daily wage of ETB 30 (**US\$0.79**) for technical jobs. In Gambella, the same company pays a minimum wage of ETB 35 (**US\$0.92**) a day, in addition to free accommodation services. There are some exceptions, however. The wages paid per day to women who provide water and weed in the oil palm nursery at Karuturi's Ilia site in Gambella regional state was smaller than the going wage rate of ETB 35 (**US\$0.92**) per

day. This was also the case for young boys under the age of 14 years who earned ETB 10 (US\$0.26) per day for the weeding job at Karuturi's Jikawo site in Gambella regional state while the going daily wage rate commonly paid by the company was ETB 35 (US\$0.92) during the study period.

In Gambella Regional State (Basen's case), the maximum wage rates can go up to ETB 167 (US\$4.39) while the minimum wage rate is ETB 36 (US\$0.95) per day. But, there are substantial variations in the amount of wage rates offered to laborers depending on the arrangements. It can go as high as ETB 167 (US\$4.39) per day for cotton picking, which is an arrangement on the basis of volume of work performed. Cotton picking, which is the most laborious duty, is foremost performed by migrant labor from Wolaita Sodo area of South Ethiopia and by highland settlers who live around the farm. The migrants from Wolaita Sodo manage to harvest up to 167 kg of cotton at a rate of ETB 1 (US\$0.026) per kg, while the settlers collect only 25 kg per day. This brings the average wage paid by Basen farm at ETB 92.4 (US\$2.43) per day (Table 2). Competition for meager labor is a common practice in Gambella. In 2011, Basen cultivated 2,100 ha of cotton but managed to collect only the cotton planted on 1,200 ha due to labor shortage, and the remaining was damaged by rain. Due to poor level of road infrastructure and its remote location, cost of labor transport is huge costing the company ETB 450 (US\$11.83) to transport a laborer from Wolaita Sodo to the farm site. Basen farm recruits labourers from Wolaita Sodo area by making formal communication with SNNP Labour and Social Affairs Bureau. Unlike the case in which companies recruit labourers by themselves from local community, this type of formal labour arrangement provides transparent agreement in terms of pay scale and other secondary benefits (e.g. transportation and accommodation).

In Benshangul Gumuz regional state, S&P pays an average wage rate of ETB 57.6 (US\$1.52) per day. While the daily going wage rate paid by the company is ETB 39 (US\$1.025), the maximum daily wage rate can go up to ETB 120 (US\$3.16) when wage-workers are offered jobs on the basis of piece rate arrangement. (This was estimated from a piece rate arrangement provided by the company, and converted into wage income per day.) A commonly piece rate arrangement is when an activity that takes 4–5 days is given to a laborer at a rate of ETB 600 (US\$15.78). Other investors in the district also use the piece rate arrangement in which they give a task that takes 4–5 days at a cost of up to ETB 1500 (US\$39.44), which portrays competition for meager labor. During peak season, S&P employed up to 700 casual laborers, which went down to 200 during off-seasons. The maximum monthly salary for a permanent employee in the S&P farm was recorded at ETB 30,000 (US\$788.84). There were 22 Indian expatriates in the preceding years working in the company before their number was reduced to three only in 2014. (S&P Farm reduced its operation in 2014 due to financial constraints and it laid off 19 Indian expatriates who had been working prior to 2014.) Two of the expatriates are working as Operation Managers, and the other one is working as a General Manager. All other employees are Ethiopians working in different capacities as Human Resource Managers and as technical persons.

Variations in wage rates and arrangements are observed in the lowland regions of Gambella and Benshangul Gumuz. As a result of labor shortage, competition for labor is common. The Great Renaissance Hydroelectric Dam, which is being constructed in Guba District – a district located adjacent to Dangur District – contributed to the stiff competition for labor in Benshangul Gumuz regional state. In Gambella regional state, Saudi Star – which

is owned by a multi-billionaire Mohammed Hussein Al Amoudi, created stiff competition for labor.

### **Inclusiveness of Plantation Wage Employment**

In this section the level of inclusiveness of plantation wage employment in terms of gender, generation and ethnic origin is discussed. Especially, the issue of which ethnic group benefited from wage employment is a critical question that a country with an ethno-linguistic federal arrangement needs to address. In this respect, the proportion of the local indigenous people who were engaged in wage employment in the large-scale farms showed significant variations. In Oromia, all the wagers were from the local villages contrary to the case in the lowland regions. In Gambella and Benshangul Gumuz regional states, migrant labor is common, accounting up to 94% of the total labor force (Table 2). The companies in these regions preferred migrant labor above the indigenous people for their experience in agricultural activities and partly due to the negative preconceptions regarding the work ethic of the local population. The latter case is also supported by Moreda (2015) in his study in Benshangul Gumuz regional state. At the Karuturi site in Gambella regional state, 24% of the wagers were from the indigenous population, compared to the other cases (Basen farm in Gambella and S&P farm in Benshangul Gumuz) in which the level of participation of the local people in wage employment was only 6–8%. Cotton picking at Basen farm in Gambella regional state is dominantly performed by migrant labor from Wolaita Sodo area. They are perceived by the employers as having the necessary dexterity and speed in picking the cotton fiber with minimum wastage. Due to their traditional livelihood system, the local Anuak are also less interested in cotton picking.

Access to wage employment is also gendered. It was confirmed that, except in the

case of Oromia regional state, women's participation in paid employment in large-scale farms is far below the proportion of men's engagement (34–36%). In these regions, women are too busy doing different domestic activities and spend less time in wage employment. This is contrary to available evidence that showed the share of women employment in agriculture is 55% in Sub Saharan Africa and 58% in Southern Asia (Giroud & Huaman, 2019).

During the field survey, we observed that companies use young boys and girls as young as 11 years for watching birds and watering nursery sites, and pay a small daily wage much below the going wage rate. Boys and girls in Gambella received ETB 10 (US\$ 0.26) per day to watch birds and watering palm oil nursery site, which showed a similar trend in Bako in which a boy who watched birds received a wage as low as ETB 7 (US\$ 0.18) per day. The going wage rates in the two regions were, however, ETB 35 (US\$ 0.92) and ETB 12 (US\$ 0.32) respectively. The practice of involving young boys and girls in various activities is common in Ethiopia (Guarcello & Rosati, 2007). It is estimated to contribute 4–7% to the family's income (Cockburn, 2002), and often done at the expense of their school attendance (Guarcello & Rosati, 2007). Poor families welcome children involvement in waged labor since it complements the income of the family. Against this background, authorities in Ethiopia seldom check large-scale farming companies that employ children despite the Ethiopian labor law (Proclamation 377/2003) prohibits employment of children under 14 years old (Federal Negarit Gazeta, 2004).

The average age of our sample was 24 years indicating that the majority are high school graduates and looking for job opportunities. In Bako, about 7% of the population is estimated to be landless. The youth in this area used to cultivate parcels that they held

customarily. But with the advent of Karuturi, as a mechanism to compensate for the land lost, some of them became wage laborers in the Farm and others seek opportunities elsewhere. A focus group discussion with five youths working at Karuturi Farm in Bako, which was held in Goromitti village revealed that the wage income received from the company is too small to improve their life, but only serve as a mechanism to partially compensate incomes lost due to the land loss.

### Determinants of Wage Incomes from Plantation Agriculture

This section discusses the factors that determine levels of income from wage employment in large-scale farming. We analyzed the determinants of wage incomes from large-scale farming in Ethiopia using the Mincer regression function. Before moving to the interpretations of the regression coefficients, let us see if the regression model fulfils the OLS assumptions. The Shapiro Wilk, the Kolmogorov-Smirnov and histogram visual test for normality tests were applied to check the normal distribution of our data. In this case if the Sig. value of the Shapiro-Wilk and the Kolmogorov-Smirnov tests are greater than 0.05, the data is considered normally distributed. The Q-Q plot is also adopted to visually examine the linearity of the data set. The Variance Inflation Factor (VIF) was used to examine if independent variables are correlated (VIF result presented in Table 2). The results of all the tests confirmed that the data set fulfilled the assumptions of linearity, normality and no serious multicollinearity problem (see Annex 1).

The Mincer (1958 & 1974) suggests including a variable that captures the effect of the interaction between schooling and experience, and the effect of returns to schooling at old age by squaring years of work experience. These two variables were included in the first estimation of the Mincer-

type earning function, but due to the multicollinearity problem, the variables were excluded in the final estimation.

The result of the final estimation is presented in Table 3. Theoretically (and in the Mincer function), level of education, working experience, age, sex of employees, etcetera determine incomes/wages of an employee and these were included in our analysis. While salaries of employees in the skilled labor market are fairly determined based on objective criteria such as level of academic qualification and working experiences, wage rates are, however, determined by less objective parameters in the unskilled labor market. In addition to this, the lack of minimum wage rate policy for unskilled labor in Ethiopia contributed to the arbitrary provision of wage rates by large-scale farms. Thus, this necessitated to identify and include other variables in the estimation of the Mincer function that would affect level of wage income in Ethiopia. Variables such as origin of laborer, type of work, type of crop and location were identified as important variables during the exploratory survey conducted in all the three regions prior to the formal employee surveys, and thus, included in the analysis.

The performance of the Mincer-type earning function was generally good. The overall model fit was significant (F value=233.7 and  $p < 0.01$ ), and the variables included in the model explained 87.8% of the variations in wage incomes, and the function is free from multicollinearity problem. The result of the Mincer-type regression that explained about 88% of the variations in wage incomes among different groups of wage-workers is acceptable given that wage rates are determined by less objective criteria and minimum wage rate policy is effectively absent in Ethiopia. Interestingly, most of the variables included in the Mincer-type earning function were statistically significant, and thus determined variations in wage incomes in large-scale farms in Ethiopia. Since the functional form of the

regression was a log-linear model, the interpretation of results is based on the percentage value of the coefficients of the independent variables that appeared significant in the estimation. The results are presented in Table 3 and in the remainder of the section, we discussed these factors in detail.

Wage incomes from plantation employment are not only biased towards the elderly but also towards male employees. Statistically, an employee's gender is found to determine the height of wage incomes significantly. The result showed that male workers receive about **8.8%** more per day than their female counterparts, since they have access to more paying jobs than females.

The companies that are engaged in large-scale farming in the case study areas maintained the commonly held stereotype that women are less fit/efficient as compared to men in performing farm activities. As a result, women are offered jobs such weeding, watering nursery site, maize shelling,

daily laborers. This happened because employers exercise their power to set wage rates, to whom to offer what type of work and in defining working conditions. This is also supported by Cramer *et al.* (2008) in Mozambique. FAO (2010) also presented a 90% wage gap between men and women in addition to inequalities in access to paid jobs between them in developing countries. Kapsos (2008) adopted the Mincerian regression and Blinder-Oaxaca wage decomposition model to decompose the observed gender earnings gaps in Bangladesh. The findings revealed that women earn 21% less than men.

The bias in wage employment is not only reflected in the degree of inclusiveness but also in terms of the wage incomes accruing to the wage-workers coming from outside the local area. Migrants generally received better wages (**12.2%** higher) than locals, and on average, their wages are ETB 11 (**US\$ 0.29**) per day higher than those of the local people. The farm managers of the plantation firms argue that migrants have better skills, and thus they are speedy in accomplishing

Table 3: Determinants of Rural Wage Rates in Large-Scale Farms in Ethiopia

Dependent variable: Ln (Wage per day)	B	Std. Error	t	Collinearity Statistics	
				Tolerance	VIF
Independent variables					
Constant	2.461	0.087	28.27***		
Age of the employee (Years)	0.001	0.002	0.27	0.71	1.41
Sex of the employee (0=Female; 1=Male)	0.088	0.036	2.45**	0.86	1.17
Years of farming experience (Years)	0.041	0.006	7.11***	0.70	1.44
Education level (Years)	0.022	0.005	4.59***	0.87	1.15
Origin of employee (0=Immigrant; 1=indigenous)	-0.122	0.062	-1.97**	0.25	3.94
Type of work (0=Manual; 1=Technical)	0.172	0.041	4.24***	0.83	1.21
Location of the farm (0=Highland; 1=Lowland)	1.072	0.064	16.75***	0.25	3.94
Type of crop (0=Food crop; 1=Industry crop)	0.131	0.048	2.73***	0.68	1.47

Source: Authors' estimation based on survey data; \*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.1$

and work as housemaids. Thus, they are paid relatively low wages. Men, on the other hand, are offered better paying jobs such as tractor operation, harvesting and threshing using combine harvester and supervising

farm activities than the locals. This takes us back to the question of whose resources are expropriated for investment in large-scale farming for the benefit of whom? Apart from other political justifications, one of the

reasons for the adoption of an ethno-linguistic federal arrangement by the Ethiopian government was to narrow down regional development disparities. Nevertheless, the result from this study show that the indigenous people are not benefiting in the same way as the migrants from wage income.

Work experience is seldom considered in the recruitment of wage-workers and in the determination of wage rates. This is because laborers do not have written testimony certifying their previous experiences, and word of mouth is rarely accepted as valid evidence. On the other hand, most of the activities do not require vast experience. As a result, work experience only matters if the remuneration is based on a piece rate system. A well-trained laborer will be able to be more productive and subsequently be rewarded a higher salary. So the interest here is to see how acquired earlier experience in large-scale farming (reflected in speed and volume of work performed) affects the wage income levels of laborers. The variable that captures previous experience of laborers was found to determine the amount of wage incomes significantly at  $p < 0.01$ . This in particular is a reason for wage differentials among those wage-workers when payment is made based on piece rate agreement and on the volume of work performed. On average, those wage-workers who had previous working experience earned 4.1% higher wages per day than those without any experience. For example, at Basen farm, the field observation revealed that experienced cotton pickers managed to harvest up to 167 kg of cotton per day enabling them to earn ETB 167 (US\$ 4.39) per day. Starters would earn not more than ETB 25 (US\$0.66) while the daily remuneration would be some ETB 36 (US\$0.95). The wage gap due to skill/experience difference might level off only after beginners acquire the needed skill/experience after some months.

The type of work performed by a wage-worker is also a factor that determines wage income differences. Generally, those who perform manual work such as weeding, chemical spraying, harvesting, threshing, housemaid, etc., are paid with the going wage rates of the region. On the other hand, those wage-workers who are engaged in supervising the laborers and operating machinery of different sorts received wage incomes higher than the going wage rates. On average, laborers that performed administrative and technical roles received a daily wage income that is 17.2% higher than those who performed manual jobs. Education is a factor that affects one's income level by affecting the type of work a wage-worker performs. Better educated wage-workers have jobs as supervisors. They received, on average, a daily wage that is 2.2% higher than those with less years of schooling. While the positive contribution of educational attainment to wage incomes is very clear and was also documented by the World Bank in Ghana (Fasih, 2008) and in Bangladesh (Kapsos, 2008), this does not mean that improved education will automatically lead to higher wages, as there may not be sufficient skilled jobs in the large-scale farms in Ethiopia to fill this promise.

The other interesting finding from the analysis was that wage incomes differ between wage-workers who worked for large-scale farms that produced food crops and industrial crops. Laborers who worked on cotton farms in Gambella received wage incomes significantly higher than those who worked on food-crop producing farms such as Karuturi, both operating in the same regions. On average, a wage-worker employed in a non-food crop producing farm received 13.1% higher wage per day than those employed in a food crop producing farm. Owing to the fact that the non-food crop producing farm is operated by a domestic investor (e.g. Basen Farm) and the other two food crop producing farms are operated by foreign investors, one may argue

that the wage difference is not a result of the type of crop commodity, but because of a difference in the ownership of the farms. The going daily wage paid by Karuturi (ETB 35 or US\$ 0.92) and Basen (ETB 36 or US\$ 0.95), both operating in the same regional state but operated by foreign and domestic investors respectively, are comparable. The mean wage incomes paid by these two companies for the different types of activities are, however, significantly different. In this regard, on average, Basen paid ETB 92 (US\$2.42), while Karuturi paid ETB 46 or US\$ 1.21 (Table 2). Therefore, it is indicative that the difference in wage incomes is because of the type of crop commodity cultivated but not due to the ownership type.

The government's strategy also iterated the significant roles of large-scale farms that produce raw materials for industries in terms of generating employment with a far-reaching income effect. In terms of the multiplying effect of wage employment, not addressed in this study, companies that produce raw materials for industries will have a much more significant impact than those that produce food commodities that are consumed domestically without much value-addition. Cramer *et al.* (2008) also found similar results in Mozambique in which workers engaged in the production of non-food crops (such as sisal and cotton) received relatively high wage incomes compared to those who engaged in food crops production such as rice, maize, groundnuts and sesame. As expected, the location of the farm affected wage rates significantly ( $p < 0.01$ ). In lowland parts of the country, labor is a serious constraint and competition for wage-workers is stiff. This has raised the wage rates in Gambella and Benshangul Gumuz regional states, and wageworkers in these regions received a daily wage which is 107.2% higher than those in Bako Tibe district of Oromia regional state. This is also related to the harsh weather conditions, high risk of malaria infestation and snake bites, poor

social infrastructure development, and high cost of living in those periphery regions. In these regions, unless wages are relatively high, laborers are not interested in taking up these job offers. Unlike the case of the large-scale farm in Oromia, the companies in Gambella and Benshangul Gumuz regional states offered free accommodation – sheds for laborers that accommodate 2–4 laborers – and set up basic health facilities to make their offers attractive. The large-scale farm in Bako does not have these facilities for the wage-workers since the laborers can operate from their own home. In addition to the advantage of enjoying relatively cheaper food prices compared to the large-scale farms in Benshangul Gumuz and Gambella regional states, its proximity to the nearby Bako town provides wage-workers with access to better social services. In an effort to address the sky-rocketing food commodity prices and costs of transportation, the companies operating in the lowland regions provided meal services at a reasonable price and transportation services to employees once a week to buy food commodities in the nearby Gublak (in the case of S&P) and Gambella (in the case of Karuturi) towns. In order to attract laborers, the large-scale farms in the lowland regions included secondary labor conditions in their employment, unlike the case of Oromia Regional State where labor availability is not by and large a constraint. Bardhan (1973) also found out that in areas where the magnitude of landlessness is very high, wage rates goes significantly down, as in the case of the large-scale farm in Bako Tibe district of Oromia regional state in Ethiopia.

### **Conclusions and Policy Implications**

Although inclusiveness of investment is a broad concept that can be realized by implementing different business models, incorporation of the local people through wage employment in large-scale plantation agriculture is one way of inclusion. The policy formulation in support of large-scale

agricultural investment in Ethiopia is based on the expectation that it will generate jobs with decent incomes for the youth. It was evident that large-scale farming engaged in the production of crops for industrial raw materials (E.g. cotton) generated higher number of jobs per hectare with relatively better incomes compared to those farms that produced food crops. Access to jobs is disproportionately lower for women compared to men, and for the indigenous people compared to the immigrants (Table 2). Wage incomes are higher for men and immigrants, and those with technical skills and farming experiences (Table 3).

Limited participation of local indigenous people in wage employment will have implication to the sustainable operation of the large-scale farms, and thus should be addressed. In this regard, stakeholders such as the government, the investor, and NGOs working in job creation should formulate and implement a strategy of enhancing the skills of the local indigenous people by arranging training on relevant farming practices. Unlike what is commonly known in the literature, the proportion of women participating in wage employment is lower than men in Gambella and Benshangul Gumuz regional states which calls for interventions in improving their participation. The framework of inclusive business model suggests that income generated from engagement of local people in any form (including employment) with agribusiness companies should be welfare improving. However, as evident in the results of this study, income generated from wage employment is too small to support daily subsistence of employees. Agribusiness companies engaged in large-scale plantation agriculture in the three regional states should consider revising the wage rates in a win-win manner.

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