

## An 'Econographic' analysis of the relevance of the Thomas Malthus theory to Nigeria and Ethiopia

Obasaju, Barnabas Olusegun<sup>1</sup>, Lawal, Adedoyin Isola<sup>2</sup>, Rotimi, Ekundayo Mathew<sup>3</sup> and Ogunjobi Olufemi<sup>4</sup>

### Abstract

Issues bordering around population studies have caught the attention of scholars in different fields. Inter alia, development economists and demographers have written plethora of literatures on it considering the multi-dimensional impacts of changing populations on the very existence of humans. Most developing countries are considered to have alarming population growth rates. Matter-of-factly, countries with seriously large population like China have had to adopt some population control measures. In this study, special reference is made to the population theory of Rev. Thomas Malthus and its relevance to the economies of these two countries. This study also re-examines the arguments of both the pessimistic and the optimistic population schools, and analysing relevant demographic and economic statistics of Nigeria and Ethiopia – the most populous and second most populous countries respectively in the African continent, draws a conclusion consistent with the view point of a world development report that rapid population growth, above all, is a developmental problem.

**Key Words:** 'Econographics,' Population Growth, Thomas Malthus, Descriptive

### (I) Introduction

The concept 'Econographic' is a compound word coined from two different words – Economics and Demographics. Different views have emerged about high population growth rate especially with respect to developing economies. Some are ardent believers of the pessimistic population school who believes that high population growth is detrimental to countries' growth and the reverse view hold for the proponents of the optimistic population school. However, theoretical and empirical evidences have been advanced in support of these different schools of thought.

Harvey (1957) and Richard (1956) in development theory popularized the idea of the Malthusian population trap and Hla (1964) argued that developing countries have fallen behind the developed countries because of their high population growth.

In analysing population changes and demographic issues, the World Bank (1984) argued that the growth rate of population in today's developing countries has become a greater burden than was the case with the comparable level of development of the now – developed countries of Europe, North America and Japan. Some of the reasons listed, among others, are:

- Population growth is now much more rapid; In industrializing Europe, it seldom exceeded 1.5% a year, compared with the 2 to 4% that many developing countries have averaged since World War II;
- Unlike 19<sup>th</sup> Century Europe, large-scale emigration from today's developing countries is not possible;
- Compared with Europe, Japan and North America in their periods of fastest population growth, income in developing countries is still low, human and physical capital are less built up, and in some countries political and social institutions are less well established;
- Many developing countries whose economies are still largely dependent on agriculture can no longer draw on large tracts of unused land.

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<sup>1</sup> and <sup>4</sup>Lecturers in the Department of Economics, College of Business and Social Sciences, Landmark University, Omu-Aran, Kwara State, Nigeria and Doctoral student at Covenant University, Otta, Ogun State, Nigeria and Ekiti State University, Ado-Ekiti, Nigeria, respectively. E-mail: [obasajubarnabas@gmail.com](mailto:obasajubarnabas@gmail.com), [jolujobi@yahoo.com](mailto:jolujobi@yahoo.com)

<sup>2</sup>A lecturer in the Department of Banking and Finance, College of Business and Social Sciences, Landmark University, Omu-Aran, Kwara State, Nigeria and a Doctoral student at Covenant University, Otta, Ogun State, Nigeria. E-mail: [l.adedoyin@yahoo.com](mailto:l.adedoyin@yahoo.com), [adedovinisola@gmail.com](mailto:adedovinisola@gmail.com)

<sup>3</sup> A lecturer in Economics Department, Federal University of Technology, Lokoja Kogi State [mathewrotimi@yahoo.com](mailto:mathewrotimi@yahoo.com)

Suffice it to say that this paper does not intend to duplicate the work by other authors but attempts to use a descriptive method in assessing the consequences of high population growth for Nigeria and Ethiopia by considering the relevant 'econographics' of both countries. To achieve this purpose, we will split this work into a few sub-headings: The Thomas Malthus Theory; Theoretical framework and literature review; 'Econographic' analysis of Thomas Malthus Theory and its relevance to Nigeria and Ethiopia; Lessons to be learnt from China; Conclusion and Recommendations.

## **(II) Thomas Malthus Theory of Population**

Brief outline of some of his 'prophecies' in his essay – "The Principles of Population" and remedial measures in 1798:

There was a tendency for the population of a country to grow at a geometric rate, while the food supply would increase at an arithmetic rate. And, since food is an essential component to human life, if population growth is unchecked, starvation would be the end result. In other words, he interpreted overpopulation as an evil that would reduce the amount of food available per person;

There are preventative checks that affect the birth rate (like late marriage and birth control) and positive checks on population that slow its growth and keep the population from rising exponentially for too long, but still a large proportion of the population live below subsistence and poverty is inescapable and will continue;

Positive checks are those that increase the death rate e.g. disease, food shortage, war and disaster; Nature's ways to control population.

## **(III) Theoretical Framework and Literature Review**

Proponents of high population growth in relation to Thomas Malthus population studies argue along this line: In developing countries, it is normal for many young children to work. Furthermore, the dependency ratio in countries with slowly growing numbers of people will also be boosted by older people who do not produce but do consume. So, based on these two grounds, saving rates are not necessarily lower in fast – growing than in slow – growing populations. Instead, the impacts of the other components of the dependency ratio on aggregate savings should be taken into account: (i) if the propensities to save of older people are high, say higher than those of the economically inactive young children / population, the aggregate savings rate will increase. In other words, if the population has good savings habit, aggregate savings will be high despite increase in birth rate. (ii) the family may also work harder to feed the children so that there need not be any adverse effect on savings;

Malthus pessimistic school of population studies emphasized the principle of diminishing returns to variable factors (notably labour) when other factors (notably land) are fixed in supply. One criticism of this position is that it fails to recognize that as resources are depleted, their relative prices will rise and there will be pressures to search for substitutes, thus stimulating technological change. Also, it may be that the benefits of the resulting technological improvements more than compensate for the pressures on resources that have stimulated them;

There are also arguments about the improvements achievable through economies of scale and scope as people are brought increasingly together;

The ultimate resource is people-skilled, spirited, and hopeful people – who will exert their wills and imagination for the benefit of us all.

Julian (1981) advanced both theoretical arguments and empirical evidence to substantiate his hypothesis that, though the initial effects of population growth on living standards are negative, there are positive long – run effects resulting from the stimulus of population growth to technological change, and from the impact of other factors on productivity growth, and that these will outweigh the initial impacts.

World Bank (1984) stated that more people imply more ideas, more creative talent, more skills, and thus better technology; in the long run, population growth is not a problem but an opportunity.

On the flip side, opponents of high population growth simply argue that:

High population growth in developing countries has given rise to a high dependency ratio. Consequent upon this, there are many young people to feed, and these children themselves do not produce but do consume;

Hence, consumption is high and saving is low when population is fast-growing;

A faster growing population has a large population at any date, so that the ratio of people (potential workers) to a fixed resource such as land is higher than it would otherwise have been. Each person has less land with which to work, and, other things being equal, is likely to produce less;

On apriori grounds and also some empirical evidence - a faster growing population or a higher population tend to depress the rate of net investment and hence productivity. Furthermore, because of its supposed propensity to increase unemployment, the general efficiency of the society will be depressed as it exerts political pressures for the creation of useless or even obstructive public – sector jobs, and that a larger population has an adverse impact on the environment (Anthony, et al., 2009).

The Punch (2012) while talking about some of the implications of Nigeria’s high population stated - “A burgeoning population naturally, comes with the pressure of coping with available resources which are already thin on the ground. In the areas of food, housing, jobs, health care, education and general infrastructure, among others, the government faces the challenges of providing for the people. Already, at the current population level, the government is finding it difficult to cope. It was in anticipation of these challenges that the British Council, two years ago, commissioned a study on Nigeria population, namely the Next Generation Nigeria. The report of the study predicted that Nigeria was headed for a “demographic disaster” if something urgent was not done to curtail the rate of growth...An honest assessment of the situation is that Nigeria is not ready for the ‘baby boom’ generation, going by the current economic conditions in the country.”

Magashi (2007) also opined that with rapid population growth, there will be fewer spaces for education especially for girls and rapid urban growth will create concentration of unemployed youths and that’s on its own a risk factor for civil conflicts, increase sexual activities through prostitutions, sexual harassment, assault, incest and rape. The end result would be, spread of Sexually Transmitted Infections including HIV/AIDS, unplanned pregnancies, unsafe abortion and adolescent mothers. All these problems will have direct negative effects on the Nigeria’s economy, quality of life and sustainable development.

Levine (2012) has these to say about the challenges of population growth for Ethiopia: Some 85% of Ethiopia’s people still live in rural sector. By itself, population growth automatically increases food insecurity among them. Can there be any doubt that malnutrition, hunger and famine comprise a major challenge to Ethiopia in its foreseeable future? To take the most extreme of these afflictions: although famines have been reported in Ethiopia for nearly as long as we have records, averaging one famine every fifteen to twenty years between 1500 and 1940, in the last fifty years famines have occurred with increasing severity and frequency, averaging one every seven years. Recall: 1959; 1973 – 4; 1985; 1995; 2003; 2006. Poverty is a major cause of these famines. At times when productions is ruined from natural hazards – drought, locusts, excessive rainfall – impoverished farmers and pastoralists have no reserves and no cash with which to secure food. Subsistence rather than commercial farming is the condition of famine in rural Ethiopia. Given that rural Ethiopians live in a subsistence economy, it follows that rapid population growth renders them more vulnerable to hunger, disease, and famine. Two million more infants per year means two million more mouths to feed, two million more children to school in a severely impoverished system. Increasing family size means decreased size of food portions and declining nutrition. Chronic hunger and intermittent famines require substantial relief aid. Over the past thirty years, population pressures have led to a 70% reduction in forestland in Ethiopia. This leaves only 3% of the country’s forests still standing in a land where some 4/5 of the people depend entirely on wood for essential energy needs. Demographers project an increase of 2.6 billion people by 2050 living on roughly the same amount of arable land. But the cycle of poverty, hunger, and disease in which millions of Ethiopians are trapped makes these factors affect Ethiopia to an extreme degree. And they threaten to grow worse, if present population trends persist.

Assefa (2012) calculated that Ethiopia’s current Total Fertility Rate (TFR = births per woman per lifetime) of 5.9 would produce a total population of about 325 million by the year 2050. This means that an area of farmland that hosted about 44 persons in 1995 and about 65 in 2012 would have to supply food for 300. Keeping to its current exceptionally high birth rate means nothing but catastrophe in Ethiopia’s future.

**(IV) ‘Econographic’ analysis of the relevance of the Thomas Malthus theory to Nigeria and Ethiopia**  
**Table A: Population, Population Growth Rate and Food Supply statistics of Nigeria and Ethiopia (selected years - 1995 to 2010)**

Econographics	Nigeria	Ethiopia
Population (people)	Year 1995 - 100.9 million ” 2000 - 117.2 million ” 2005 - 136.3 million ” 2010 - 150.3 million	1995 - 56.9 million 2000 - 65.5 million 2005 - 74.7 million 2010 - 84.8 million
Average Population Growth Rate Per Annum	Between 1995 & 2000 - 3.2% ” 2000 & 2005 - 3.3% ” 2005 & 2010 - 2.1%	Between 1995 & 2000 - 3.0% ” 2000 & 2005 - 2.8% ” 2005 & 2010 - 2.7%
Food Production (Millions of 2004 – 2006 Int\$)	Year 1995 - 23,086 ” 2000 - 27,544 ” 2005 - 33,872 ” 2010 - 30,386	Year 1995 - 4119 ” 2000 - 5122 ” 2005 - 7120 ” 2010 - 8631
Food Production Growth Rate Per Annum	Between 1995 & 2000 - 3.59% ” 2000 & 2005 - 4.22% ” 2005 & 2010 - (-)2.15%	Between 1995 & 2000 - 4.46% (+) ” 2000 & 2005 - 6.81% (+) ” 2005 & 2010 - 3.92% (+)

**Sources: IMF (2011) – World Economic Outlook**  
**FAOSTAT, FAO of the UN (2012)**

Please note that the statistics for the periods we considered are similar for those of the other periods and (+) = positive growth while (-) = negative growth  
 Parenthesis: (growth pattern)

*Let’s refer to the first point under Thomas Malthus theory: Have population and food supply for both countries grown at a geometric and arithmetic rate respectively?*

Well, as observed in Table A above, the results invalidate the first postulation of Thomas Malthus theory that population and food supply for both countries will grow at a geometric and arithmetic rates respectively. Notwithstanding, the growth of the countries’ population increased progressively over the years. Within 2000 and 2005, the population averagely grew by 3.3% and 2.8% respectively in Nigeria and Ethiopia. During the same period, food production rose simultaneously with the population. Inversely, within years 2005 and 2010, food production growth rates (though positive for Ethiopia) fell from 6.81% to 3.92% while it had a negative growth rate of -2.15% as compared with the previous 4.22% growth in Nigeria. Contrary to the food growth behavior postulation of Malthus, the food production growth rate is not constant and even negative between some periods.

Before delving deeper, we need to bear in mind that Ethiopia’s population alone, as at 2010, was greater than the combined populations of nine Sub-Saharan Africa countries including among others, Angola, Cameroon, Botswana and Burkina Faso and that Nigeria’s population is almost double that of Ethiopia! (IMF, 2011). For both countries, population growth is above 2% for all these periods under consideration. This is consistent with a World Bank Report (1984): In industrializing Europe, it seldom exceeded 1.5% a year, compared with the 2 to 4% that many developing countries have averaged since World War II. Yet population growth rate for both countries have been declining, these declines however are less than proportionate to the declines in food production growths for the two countries.

In addition to the information shown in the Table A, for Nigeria, growth in food imports (excluding fish), valued in millions of US dollars, was 15.5% between 1994 and 1999 and 12.96% between 2004 and 2009. This means a drop in food import by 2.54% which could be said to be an improvement. Growth in food exports excluding fish rose from 1.47% to 14.64% between the same periods. But Import of fish was valued at USD665 million in 2008 while export of same was valued at USD75 million also in 2008 (FAOSTAT, 2011). Hence, a net food trade deficit was posted. For Ethiopia, food export (excluding fish) growth has not been steady as it was 26.43% between 1994 and 1999, 19.75% between 1999 & 2004 and 35.51% between 2004 and 2009 while food (excluding fish) import has been steady and had grown from -13.76% to 15.99% and to 28.09% for the same periods.

Moreover, it was reported that as many as 4.6 million Ethiopians need food assistance annually. Also, her human development indicators are low, with exceptionally alarming statistics regarding food security (UNDP, 2011). Relatively, China, the world’s most populous country with about 1.3 billion population, has been able to escape the possibility of being caught in what is referred to as the Malthusian population trap. According to the World

Bank (2012), her growth in food production has been greater than population growth. Her population growth as at 2011 was 0.49% and the question now is – who will China feed? Today, China is said to be the world’s largest agricultural producer; produces 30%, 20%, 25%, 37% and 50% respectively of the globe’s rice, corn, cotton, fruits / vegetables and pork. Furthermore, for most products, China’s world share of production is close to or exceeds its 20% share of world population.

**Table B: Poverty Rate, GNI Per Capita, GDP Per Capita, Birth Rate, Death Rate and Total Fertility Rate**

Econographics	Nigeria	Ethiopia
Poverty Rate	68%(below \$1.25 per day Purchasing Power Parity - PPP) (2010)	39%(below \$1.25 per day PPP) (2009)
GNI Per Capita	US\$1,230 (2010)	US\$380 (2010)
GDP Per Capita	\$2,459 PPP (2010)	\$1,100 PPP (2010)
Birth Rate	36.65 births / 1,000population (2009) 39.23 births / 1,000population (2012)	43.66 births / 1,000population (2009) 42.99 births / 1,000population (2011)
Death Rate	16.56 deaths / 1,000population (2009) 13.48 deaths / 1,000population (2012)	11.55 deaths / 1,000population (2009) 11.04 deaths / 1,000population (2011)
Total Fertility Rate	4.73 children born / woman (2011)	6.02 children born / woman (2011)

**Source: IMF (2011) – World Economic Outlook**

*In the outline of the Thomas Malthus postulation, considering points two and three, some key words worthy of notes are preventative and positive checks like birth rate and death rate plus poverty which he said is inescapable if population continues to grow.*

Now, we may be interested in knowing whether or not the birth and death rates for both countries have been able to keep the population growth in check.

For Nigeria, the birth rate increased between 2009 and 2012 by about 2.58 births / 1,000 population and the death rate reduced by about 3.08 deaths / 1,000 population. Hence population growth is undisturbed. In the case of Ethiopia, the birth and death rates reduced by about 0.67 births / 1000 population and about 0.51 deaths / 1,000 population respectively signifying that the decrease in both variables are but marginal. However, despite these marginal declines, the fertility rate per woman is on the high side as a woman gives birth to six children on the average implying that population growth would continue unhampered if this fertility trend continues. For Nigeria, an average Nigerian gives birth to five children (2011 estimate). For both countries, the birth rate is by far above the death rate. Comparing these statistics with those of China, the fertility rate for China is reported to be 1.54 children born / woman with relatively low birth rate (12.29 births / 1,000population) and death rate (7.03 deaths / 1,000population) (2011 estimate).

However, very challenging to the populations of these two African population giants is the existence of high levels of poverty. Nigeria’s case is worse, with about 68% of her population living below \$1.25 per day (at purchasing power parity). Ethiopia that seems to be better in these regard has a very low Gross National Income (GNI) per capita which is a measure of personal income distribution in a country and her GDP per capita, a measure of output/value added per person is also very low. China’s GDP per capita was estimated as \$4,736 and GNI per capita \$32,780 (2010) as compared with those of Nigeria and Ethiopia as observed in Table B. These, and more, are pointers to the fact that the world’s most populous country churns out reasonable outputs much more than ‘children.’ Diseases, amid other positive checks, as postulated by Malthus, has contributed to death rates. Malaria fever, typhoid fever, hepatitis A and E, meningococcal meningitis, schistosomiasis and so on have claimed so many lives in both Nigeria and Ethiopia. For example, about 170,000 Nigerians were said to die of HIV / AIDS in 2007 and the statistics increased to about 220,000 in 2009 thereby making her rank second after South Africa with about 310, 000 deaths while in Ethiopia, in 2003 and 2007 respectively, 120,000 and 67, 000 deaths were recorded as a result of HIV / AIDS (CIA World Fact Book 2012). Ethiopia is also reported to rank 7th among the world’s 22 high – burden tuberculosis (TB) countries. According to the World Health Organisation (WHO’s) Global TB report of 2009, the country had an estimated 314, 267 TB cases in 2007 with an estimated incidence rate of 378 cases per 100, 000 population. With these and more, we can say that although diseases have led to deaths and reduced what the total populations would have been, the total death rate is still far below birth rate thus keeping the population growth rate above 2% per annum.

From the foregoing, it is clear - cut that population growth rates have been positive throughout the periods while for some periods, food production growth rates are negative despite that the former and latter did not grow at

exactly geometric and arithmetic rates. In one word, for both countries, population growth rates have exceeded food production growth rates in the aggregate. Hence, without mincing words, if food production climate remains the same, i.e. does not increase significantly and consistently, may God help her, or else, the population giant of Africa and her 'runner - up' will have the prophecies such as of population starvation put forward by Malthus fulfilled.

#### **(V) Lessons to be learnt from China**

To curb rapid population growth, a brief assessment of China's one – child policy shows that it is a veritable tool: it has been spectacularly successful in reducing population growth, particularly in the cities. In 1970, the average woman in China had almost six (5.8) children, now she has about two. The most dramatic changes took place between 1970 and 1980 when the birthrate dropped from 44 per 1000 to 18 per 1000. Demographers have stated that the ideal birthrate for China is 16.7 per 1000 or 1.7 children per family. One way the government records progress in its birth control programmes is by monitoring the "first baby" rate - the proportion of first babies among total births. In the city of Chengdu in Sichuan for a while, the 1st baby rate was reportedly 97%. One Chinese official said that the one – child policy has prevented 300 million births, the equivalent of the population of Europe. The reduction of population has helped pull people out of poverty and been a factor in China's phenomenal economic growth.

*The rewards of the policy:* parents who have only one child get a "one – child glory certificate," which entitles them to economic benefits such as an extra month's salary every year until the child is 14. Other benefits are – higher wages, interest – free loans, retirement funds, cheap fertilizer, better housing, better health care, and priority in school enrolment. Women who delay marriage until after they are 25 receive benefits such as extended maternity leave when they finally get pregnant. These privileges are taken away if the couple decides to have an extra child.

*The punishments for disregarding the policy:* The policy theoretically is voluntary, but the government imposes punishments and heavy fines on people who don't follow the rules. Parents with extra children can be fined, depending on the region, from \$370 to \$12,800 (many times the average annual income for many ordinary Chinese). If the fine is not paid, sometimes, the couples land is taken away, their house is destroyed, they lose their jobs or the child is not allowed to attend school.

Although these punishments to some seem to be over the top, the successes recorded for the Chinese government is a landmark. Suffice it to say that, if the governments of these two African population giants have the needed political wills, similar policy to this could be of immense help. But implementation of this kind of policy would also call for massive orientation for the people on its implications, good database management by the government to monitor things like birthrates and ages before marriage among others.

On the other hand, to boost food production, these two countries should learn from China: Her research institutes are developing new crop varieties and production systems that could increase yields and use water more efficiently; the livestock industry's importing breeding stock and developing larger scale commercialized operations to improve the efficiency of livestock production; agricultural officials seek to band small firms together into "production bases" to supply uniform products to selected agribusinesses which, in turn, supply farmers with standardized inputs, technical information and production credit (United States Department of Agricultural / Economic Research Service – Amber Waves, 2008). In addition, potent and speedy measures have to be taken to foster investment in education and research and development: Nigeria ranked 154th (66.6% literacy rate) while Ethiopia ranked 181st (28.0% literacy rate) out of 183 countries as at 2011 (UNDP 2011). China ranks 68th with 95.9% literacy rate; little wonder she harnesses her human and natural resources well for development as education as a human capital has a positive indispensable corollary on any nation's development. Moreover, governments' expenditures on research and development for both countries have not helped matters: Ethiopia's expenditure on research and development is just 0.17% of her GDP corresponding to \$0.1billion PPP and makes her rank 72nd in the world. Nigeria's statistics was not even available. China ranks 2nd after the United States with the former's expenditure on R & D being 1.4% of her GDP (\$153.7 billion PPP) and 2.7% (\$405.3 billion PPP) for the latter. This is a lesson for the two giants of Africa in terms of population.

#### **(VI) Conclusion and Recommendations**

The postulations of Thomas Malthus have to a large extent been relevant to the two African countries – Nigeria and Ethiopia.

The fact is that both countries do not yet have the means to cater for a rapidly growing population as it would pose a serious challenge, nay, problem, to them. To this end, this work is inclined to go along with the following statement from the World Development Report 1984 (p. 80): "The costs of rapid population growth differ greatly from country to country. Those differences are not confined to differences in natural resources. In countries

heavily reliant on agriculture, a scarcity of natural resources does matter. But the underlying problem is *low income* and *low levels of education*, which are sources of rapid population growth and simultaneously make the required adjustments to it more difficult. Much of the world's population lives within the benefit of clear signals to *encourage smaller families*; yet these are the families and the nations in the worst position to make the adaptive responses that rapid population growth requires. That is why rapid population growth is, above all, a *development problem.*"  
(Emphasis ours).

Here are some suggestions to these two African countries to enable them break-free from the present and possible future grave negative consequences of their rapid population growths:

They both need to take investment in education more seriously as especially for women, keeping girls in school longer will postpone the age at which they begin to bear children and empower them to consider the advantages of smaller families and to learn about family planning.

It is also pertinent for both governments to increase their expenditures on R & D as this can lead to improved technology and increase in employment opportunities translating into decrease in: low levels of income, investment / savings, productivity and ultimately the vicious cycle of poverty.

In addition, both countries need a proactive national government which could explore some potent population control measures like – dropping maternity benefits for couples with more than three children, requiring men and women to attend classes about contraception before obtaining a marriage license, and making both condoms and contraceptive pills widely available.

Furthermore, all stakeholders – the private groups, Non-governmental organisations and the public at large have to be oriented about the advantages of a manageable population size on one hand and the dangers of uncontrolled population growth on the other hand for both countries. The mass media and other information dissemination instruments could be used to achieve this end.

Since agriculture provides over 70% and 80% of all employment in Nigeria and Ethiopia respectively (Wikipedia, 2012), both governments should pay more attention to it by supplying the necessary resources and giving incentives to people who venture into it whether in small or large scale. Nigeria for example can invest more in cassava production since she is the largest supplier of it and has a comparative advantage of producing it over other countries. Ethiopia also should channel more resources into the production of maize because she is the second largest producer of it in the world and into rearing of livestock since she is the largest exporter of it in the world (Wikipedia, 2012). These would boost food production, revenue and employment for the countries and their citizens.

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