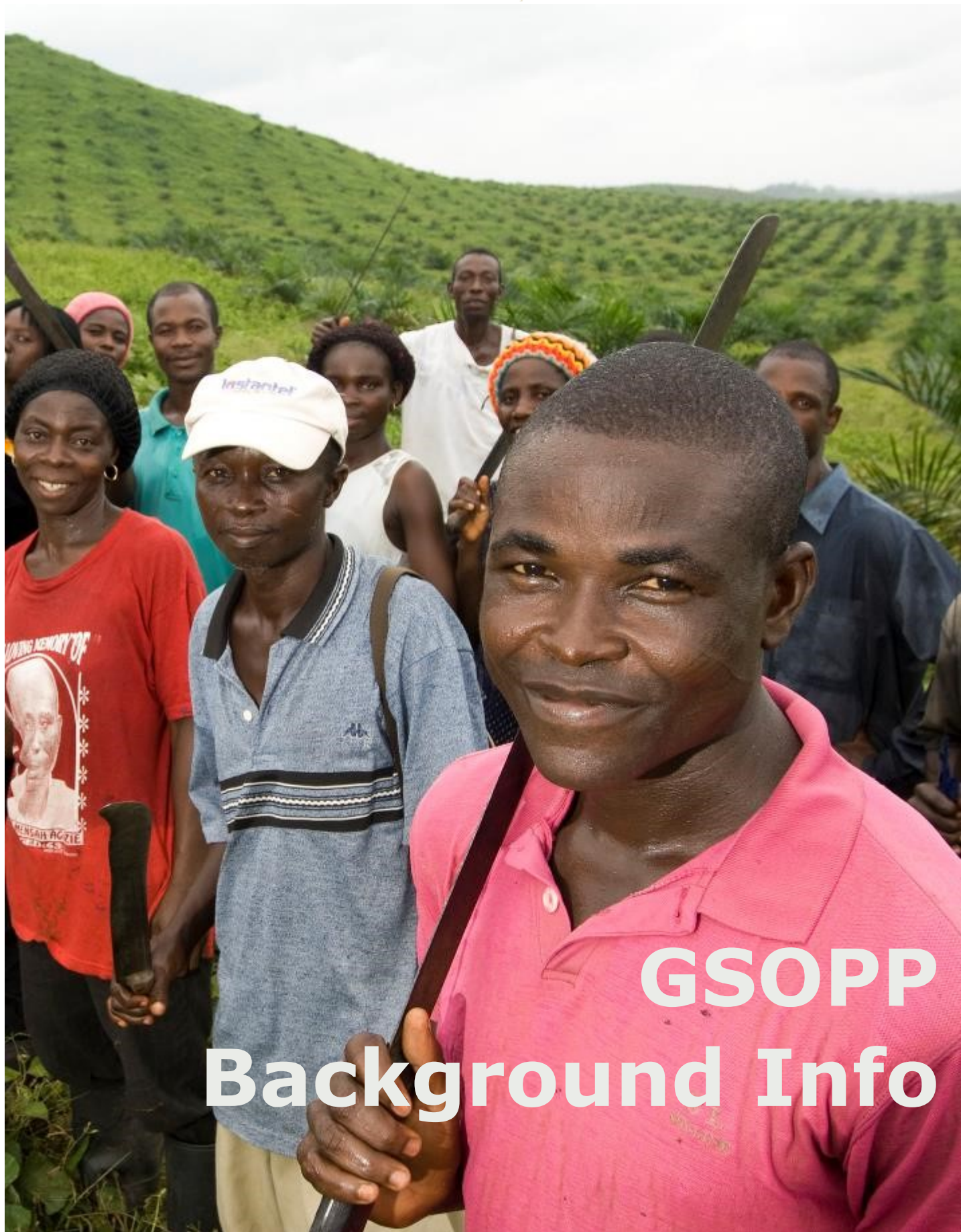


# GOLDEN STAR



**GSOPP**  
**Background Info**

## Oil Palm and Ghana

Oil palm is indigenous to Ghana and palm oil is an important local staple food for Ghanaians of all cultural backgrounds. Vast tracts of Ghana are located in what is known as the 'Oil Palm Belt' of West Africa.

The climate and soil suitability in many parts of Ghana strongly favour oil palm production, and Ghanaians have farmed oil palm for centuries.

Oil palm plays a major role in culture, tradition and practice, and is the main livelihood for over 2 million Ghanaians, with over 6 million dependent upon the industry, almost a quarter of the population.

### Oil Palm Supply and Demand

Of the 17 major vegetable oils traded on the international market, palm oil is the most important and accounts for more than half of the global import and export trade of all vegetable oils. The USDA estimated global production of palm oil at 50 million tonnes in the crop year ending September 2011.

Palm oil accounts for more than 20% of the global edible oil market, and is the second most consumed edible oil in the world. With its increasing use by the food, health and cosmetics and biodiesel industries, global demand is expected to continue growing.

Oil palm demand continues to climb, and the challenge for Government's involved in the production of palm oil, according to the former Ghanaian Deputy Minister for Food and Agriculture, is to expand the industry in a way that is environmentally and socially sustainable without deforestation.

### Oil Palm and Ghana

Not only is oil palm the second most important tree crop in Ghana, after cocoa, but in 2016 the Ministry of Food and Agriculture indicated that 6 million Ghanaians had livelihoods that depended upon oil palm.

Indeed, so important to the country's economy is oil palm, that in March 2016 the Government proposed the development of an Oil Palm Development Agency to enable the country to realise the needed investment and grow the oil palm sector—considered critical to the development of the country's economy.

Within Ghana, the production of crude palm oil (CPO) is insufficient to meet even internal demand, and Ghana imports between 30,000 and 65,000t of CPO annually from Asia, at an estimated cost of some US\$300 million annually. Projections of demand indicate that the present CPO shortfall will continue and even grow larger in the future in Ghana (MASDAR 2011).

### Oil Palm and Employment

An analysis by the World Bank found that oil palm provides more jobs per hectare than other large scale farming (it employs about 0.4 people per acre), and the jobs are year-round rather than seasonal, providing sustained incomes to farmers. A 2011 study into oil palm in Ghana found that the industry employs over 2 million people, primarily from rural areas, and by extension contributes immensely to rural wealth and employment creation (MASDAR 2011).

### Oil Palm and Poverty Reduction

Ghana has one of the highest GDP per capita in Africa, yet despite an abundance of natural resources, almost a quarter of the population live below the poverty line (Ghana Statistical Service 2014). 2011 studies report that the smallholder production of CPO makes a substantial contribution to GDP, as well as being labour intensive. The study found it noteworthy that the District at the heart of oil palm development in the country has the second lowest poverty rate in Ghana.

### Vegetable Oil Sources and Oil Palm

Studies have shown that oil palm has a number of advantages over other crops for vegetable oil production. The Food and Agriculture Organization (FAO) in a 2006 study found that oil palm production has a relatively low cost, for example, soy oil, the next lowest, is still 20% higher cost than that of palm oil.

Additionally, oil palm produce more oil per unit of 'land take', that is, although the land under oil palm cultivation globally constitutes about 5% of the total land devoted to vegetable oils, palm oil accounted for more than a third of all vegetable oil produced in 2007. To meet the vegetable oil demands of the projected global population increase, palm oil would require just 15% of the land that would need to be cultivated if the demand was to be met through soy oil production.

A further unique feature of the crude palm oil market that contributes to its success, is that it is not in any way linked with a by-product market unlike most of the other vegetable oils.

# Oil Palm and Ghana



## Golden Star Oil Palm Plantation

The Golden Star Oil Palm Plantation (GSOPP) was established in April 2006 as a non-profit subsidiary of Golden Star.

GSOPP in partnership with the Traditional Authorities, and affected farmers, with the support of the agro-forestry industry, promotes the development of oil palm plantations amongst our catchment communities, using the smallholder concept.

Through GSOPP, we continue to advance the businesses objectives of reducing poverty through employment generation, and promoting wealth creation through sustainable agri-business.

Funded by Golden Star through US\$1 per ounce of gold produced, to date we have directed over \$6.6 million to this important initiative.

### Location Suitability

GSOPP is located in an area known as the 'Oil Palm Belt' of West Africa. Oil palm is indigenous to the area and self-propagates. Major studies of oil palm conducted in 2011 illustrate that the GSOPP business and future potential expansion areas (committed land) are located in the Districts of Ghana classified as being of highest suitability—both for climate and soil suitability.

### Land for Plantations

GSOPP has developed a unique approach to land acquisition. Through extensive community engagement and consultations, GSOPP solicits lands from local chiefs, and/or landlords who offer their lands and in return benefit directly from the oil palm cultivation. This is a form of partnership arrangement which promotes more productive use of the land, resulting in long-term employment and income generation in the catchment.

Tenancy agreements established with the farmers incorporate loan re-payment, and obligations for maintenance, harvesting and sale of farm proceeds minimizing conflicts that traditionally arise from changing expectations.

With this concept of partnership, the major issues confronting land tenure associated with large scale agricultural developments are to a greater extent minimized. Additionally, as the plantations are supervised by GSOPP, all parties benefit from higher yields, resulting in ongoing support for the use of the land for this purpose.

### Avoiding Displacement

The GSOPP approach to land acquisition ensures that any tenant farmers on land to be converted to plantation have the right to become GSOPP participant farmers. Farmer selection is based on impact and resident status with the host community.

Where plantation is to be established over existing farms, oil palm is established within the existing farms so as to not displace food crops. As food crops are harvested, the oil palm is extended into these areas, and farmers gradually convert to the new cropping regime. This process avoids displacement, and enables farmers to integrate into the plantation concept at a manageable rate.

In over 10 years of operations at GSOPP there have been no recorded cases of displacement. GSOPP only establishes plantations with the explicit support of, and under Agreement with the traditional landowners, thus avoiding compulsory acquisition and involuntary resettlement of any type.

### Land Use Competition

In Ghana, agriculture competes primarily with illegal mining (not artisanal), and urban development. In a low socioeconomic context, many landowners opt to allow illegal mining in view of the perception of high revenues returns. In 2015 the Minister for Lands and Natural Resources, in a major media article, indicated that Government estimates suggested over 1 million people were engaged in illegal mining at that time.

With a growing realization of the negative impacts of illegal mining, conversion of former mining lands to productive agriculture has the potential to significantly improve both environmental and socioeconomic outcomes from these heavily impacted areas. Conversely, the success of the GSOPP as a revenue generator, has continued to protect these lands from encroachment by illegal miners.

### Productivity in Ghana

A major opportunity identified for Ghana in its 2011 Master Plan Study for the Oil Palm industry, is productivity. The world average production of fresh fruit bunches is 18 t/ha. Plantations in Malaysia yield 30 t/ha whilst Cote d'Ivoire, which has similar soil and climatic conditions to Ghana yield 25 t/ha. In Ghana, plantations are recorded as achieving 15 t/ha, and small holders average just 6 t/ha.

At GSOPP, with the application of best agronomic practices, our smallholder plantations now achieve 18 t/ha, three times the Ghanaian average, and on par with world average production for plantations. Most importantly, this translates to better returns for farmers, and demonstrates the attractiveness of oil palm as a livelihood.

At GSOPP this is achieved without destruction of forest or land of conservation value, instead focusing on conversion of low value subsistence farms or former mined lands.

# Land Access



# Livelihoods Enhancement

## GSOPP and Poverty Reduction

2011 oil palm industry wide studies conducted in Ghana reported that most oil palm farmers earned between 360 and 1800 GHc per annum (2011). GSOPP farmers, with high yielding palms, and plantations under good plantation management practices, have revenues on average of 14,016 GHc (2016-18) per annum. This level of earnings means GSOPP farmers earn 4.7 times the National mean consumption level and more than 17 times the current Ghanaian poverty line (Ghana Statistical Service 2014).

## Access to Credit

The majority of small-scale farmers in Ghana, the mainstay of the agriculture industry, operate on the fringes of the economy and hence lack access to financial institutions to expand or even develop their businesses. In a downgrading economic context, interest rates in Ghana presently exceed 25%, ensuring that even were access to funds available, most farmers could not fund loan repayments regardless.

GSOPP provides interest free loans to its farmers avoiding issues associated with access to capital and initial operating expenditures. Loans repayment commences when yields reach nominated levels of maturity, to ensure that first and foremost, farmers have sufficient revenue to maintain an appropriate standard of living.

## Transport to Market

In Ghana there is a history of cases where plantations are established without good road support networks. As the main fruit production season coincides with high rain, this has resulted in cases where fruit is not collected, and rots, leading to loss of income to farmers.

At GSOPP, road maintenance forms an integral part of the plantation maintenance cycle, ensuring access for fruit collection and sales.

## Planting Materials

The Ghana Master Plan Study found that many farmers in Ghana planted oil palm of dubious origin, impacting on production and yields.

At GSOPP we use only seedlings of proven varieties and no wild harvested seedlings. Varietals are selected on a site by site basis on the assessment of climatic and soil conditions. In addition to the specialist technical agronomic advice of the GSOPP team, farmers also benefit from extension support provided by Wilmar BOPP and Solidaridad West Africa through GSOPP.

In 2018 GSOPP commenced a microcredit scheme for farmers and workers to provide small business loans and act as a model for savings, ahead of re-planting in the next decade.



# Human Rights

## Freedom of Speech and the Right to Associate

All GSOPP employees and participant farmers have access to a number of forums of engagement and exchange. These include plantation meetings, agronomic extension sessions and programs, and sessions to develop farmer business schools. In addition to route communication forums, extensive dedicated meetings are held annually with all farmers to communicate and engage on progress against GSOPP annual action plans, and to provide an open and transparent forum for exchange of ideas.

A major aspect of the GSOPP sustainability has been our work to establish, support and maintain Farmer's Associations, and to work through these Associations to bring skills and capacity building to our host communities.

GSOPP has an established Grievance Mechanism that complies with International Finance Corporation (IFC) requirements.

## Child and Forced Labour

All GSOPP farmers enter into Tenancy Agreements at their own discretion and under no duress.

GSOPP farmers and workers participate in an array of consultation forums and capacity building and extension programs, and education is provided at these forums on human rights, health, education and financial aspects, all forming part of wellbeing.

GSOPP Farmer Associations and their Executive play a key role in regulation of standards and behaviors in the plantations, and ensure that participant farmers are engaged and educated on these requirements.

There have been no instances of child or forced labour recorded or observed at the GSOPP plantations in over 10 years of operation.

## International Development Support

GSOPP has had the ongoing support of the Wilmar BOPP organization, and two major international development agencies, Solidaridad West Africa and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Wilmar BOPP and Solidaridad provide agricultural extension support to GSOPP and participant farmers, including agricultural extension trials, demonstration plots, as well as soil and crop nutrient content testing.

GIZ conducted a major baseline study and poverty impact assessment for GSOPP, and have further supported the establishment of the farmer business schools including training on savings, pension planning and other financial management skills development. All GSOPP participant farmers have bank accounts that GSOPP helped have established and farmers are paid into these accounts.

## Diversity

Women make up almost a third of the GSOPP workforce (participant farmers and contract labour), and all hail from the host communities.

Tenancy agreement conditions are equitable and diversity inclusive with no discrimination made on the basis of gender or any other aspect of diversity. Interest free loans to farmers are provided to all participant farmers inclusively over the period of plantation immaturity, regardless of gender. Thus unlike in other areas, women's access to credit/business capital is effectively equal.

Traditionally women perform specific tasks in oil palm development, field maintenance, harvesting and production. Even in production, it is primarily women who are in charge of specific aspects of processing, and sales, thus the expansion into downstream processing provides the opportunity to further enhance outcomes for women.

Studies in Ghana show that women face major problems in Ghana in marketing their products due to a lack of bargaining power. Through GSOPP, fresh fruit bunch prices and in the future crude palm oil prices, will be negotiated by GSOPP on behalf of the entire plantations, and participant farmers, thus removing disadvantage to women and other vulnerable people in the system.



# Environment

## Indigenous Tree Species

Oil palm is indigenous to Ghana, and as a provenance species readily self-propagates. The GSOPP plantations are located exclusively in an area known as the 'Oil Palm Belt' of West Africa. Oil palm is GM free.

## Biodiversity Protection and Conservation

No GSOPP plantation has been developed on land gazetted as Forest Reserve, National Park, or any other internationally recognized form of conservation classification (e.g. RAMSAR, Important Bird Area).

GSOPP plantations are hosted on traditionally owned stool or private lands, that have typically been used for farming or some other type of agriculture. Under the GSOPP model land owners receive a direct portion of plantation revenues, and existing farmers are invited to become GSOPP participant farmers, thus avoiding displacement.

More recently, GSOPP has expanded into areas of formerly mined lands, as the next agreed land use in a multiple sequential land use cycle. This not only results in rehabilitation of these impacted areas, but often also results in an upgrade in value of the land relative to the pre-mining condition.

## Wildlife Protection

In the Western Region, studies by the Forestry Commission (Forest Services Division 2013) and others indicate that possibly the single greatest pressure on wildlife in Forest Reserves is illegal hunting.

Through GSOPP, people that may otherwise engage in illegal hunting to obtain food, earn a good income, and become less likely to engage in illegal activities.

## Climate Change

Independent studies show that oil palm plantations are as effective as rain forests in reducing carbon dioxide, a critical contributor to global warming (MASDAR 2011).

Providing oil palm plantations are not established at the loss of tropical and other forest, palm plantation can be a legitimate and improved use of the land over pre-plantation conditions. In the case of GSOPP, where plantation is established on former lower value farm land, the dense biomass of an oil palm plantation represents a greater carbon dioxide sink than the former seasonal crops would have provided. When plantation is established, oil palm is initially intercropped with the existing seasonal food crops. Only after harvest, when the farmer would either fallow or slash and burn the land (tradition), is additional oil palm planting undertaken. In addition the greater biomass of the oil palm, as a longer lived cash crop, slash and burn agricultural practices are also avoided, with significant benefit to greenhouse gas reduction and ultimately climate change.

## Energy Consumption

Whilst the GSOPP mill will have a back-up power supply, energy consumption will be low, with most processing sections powered by a boiler consuming waste products. Most estate sized mills produce excess power that can be fed into the grid.

## Weed and Pest Management

The GSOPP plantations undergo annual sampling to assess for oil palm pests including the leaf miner. The plantations have high standards for maintenance including weed management, that form part of the conditions of the Tenancy Agreements and limit risks of invasion by the rice rat, a known oil palm pest that destroys young oil palm trees and food crops.

## Waste Streams

The key waste streams of palm oil processing are empty fruit bunches (EFB) and palm oil mill effluent (POME). The planned proximity of the GSOPP mill to the main GSOPP plantations will allow the EFB to be used as mulch. This is a conventional use and returns nutrients to the soils and assists in moisture retention and weed inhibition. Again, with the proximity of the GSOPP mill to the main plantations, the POME product will also be able to be irrigated into the plantations as a source of water and fertilization. Shell and kernel wastes will be used as boiler fuel.

## Environmental Permitting

The mill plant would be required to be permitted by the Ghana Environment Protection Agency (EPA). Golden Star has extensive experience in EPA permitting processes and will oversee these processes for environmental impact assessment to ensure international standard assessments are conducted.

## Noise and Air Quality Management

As an industrial facility the GSOPP mill have emissions to air including fume and noise. The Ghana EPA have established limits for such emissions that will be required to be met. Golden Star has extensive expertise in environmental monitoring and will undertake such statutory monitoring for the mill operation.



# The Future

## Upside and Growth

The GSOPP mill evaluation has been conducted on a conservative base case model excluding potential upside. There remains significant potential for this project in the terms of the following:

- Assumed CPO prices are lower than the long-term average achieved price.
- There remains the potential to attract outside purchased fruits (OPF) to the mill business for additional profitability. Fruits grown within a 50km radius could be viably transported to the GSOPP mill.
- Organic growth of the GSOPP plantations is not included beyond 2018 despite land commitments by host communities.
- Oil palm plantation is the agreed next land use in a number of current and active mining areas. Further plantation organic growth will be achieved as these sites are reclaimed.
- All market projections are for growth in demand in crude palm oil as the product is increasingly used in food, health, cosmetics and biofuel industries. Presently Ghana is unable to meet even its internal demand for crude palm oil.

- The base case model has the mill operating for a single shift of operations, with potential to expand into double shift.
- The GSOPP proposed mill is modular and can be scaled up to 20 tonne per hour for further expansion.

## Leading Practice and Industry Standards

GSOPP applies Best Management Practices (BMP) for its oil palm operations, and farmer Tenancy Agreements require application of these standards.

With the support of other industry partners GSOPP has commenced programs towards full implementation of the principles and criteria for the production of sustainable oil palm production, as outlined by the Roundtable on Sustainable Palm Oil (RSPO).

Following decades of industry research, and field revegetation trials, in 2017 and 2018 GSOPP commenced plantation establishment over some 100 hectares of former mined lands, demonstrating our long-term commitment to ensuring sustainability through multiple land use.





**FOLLOW US ON FACEBOOK**  
[FACEBOOK.COM/  
GOLDENSTARRESOURCES/](https://www.facebook.com/goldenstarresources/)



**FIND US ON LINKEDIN**  
[LINKEDIN.COM/COMPANY/  
GOLDEN-STAR-RESOURCES](https://www.linkedin.com/company/golden-star-resources)



**FOLLOW US ON TWITTER**  
[TWITTER.COM/  
GOLDEN\\_STAR\\_RES](https://twitter.com/GOLDEN_STAR_RES)



**READ OUR BLOG**  
[GOLDENSTARINTHECOMMUNITY.BLOGSPOT.CA/](https://www.goldenstarinthecommunity.blogspot.ca/)

## Contact

For further information in relation to GSOPP please do not hesitate to contact the following:

Philipa Varris  
Vice President—Corporate Responsibility  
[pvarris@gsrgh.com](mailto:pvarris@gsrgh.com)  
+ 233 54433 7046

Bruce Higson-Smith  
Senior Vice President—Corporate Strategy  
[bhigsonsmith@gsr.com](mailto:bhigsonsmith@gsr.com)  
+ 1 416 583 3803

Anu Dhir  
Director—Golden Star Resources Limited  
[adhir@miniqs.com](mailto:adhir@miniqs.com)  
+1 416 270 9240