



Mercy-USA[®]

Mercy-USA for Aid and Development

Olive-Pit Biomass case study

Olive Pit Biomass Fuel “Pirina”

Northwest Syria has been grappling with a multifaceted humanitarian crisis, characterized by conflict, displacement, and resource scarcity. The ongoing conflict has led to the destruction of infrastructure, including energy sources, leaving many households without a reliable means of staying warm during the winter. Before the crisis, people were relying on the refined diesel provided by the government for heating. After the crisis, the diesel was refined manually using traditional and unsafe methods.

The use of diesel has a negative impact on human health and the environment as well as contributing to many fire incidents, mainly in camps. Mercy-USA, an active member of the SNFI cluster, was the first organization to implement a project to support the heating needs using *Pirina*.

Pirina is a byproduct of olive oil extraction, consisting of crushed olive pits, pulp, and skin. Traditionally considered a waste material, its potential as a biofuel source has gained attention due to its abundance in regions like Northwest Syria, where olive cultivation is prevalent. The region produces a significant amount of olive pomace, creating an opportunity to address energy needs sustainably.

The key positives of Pirina:

- First, it is renewable. These resilient trees keep producing olives no matter the season, which means a steady supply of pits. As long as we keep enjoying olives, we have a renewable fuel source at our fingertips.
- Second, it's eco-friendly. When we burn these pit pellets, they release far fewer pollutants compared to traditional fossil fuels. It's a cleaner, greener way of getting our energy.
- Last, it's all about utilizing waste. By turning olive pits into fuel, we're not just solving a waste problem but creating value. I like to think of it as a form of alchemy - transforming something seen as 'worthless' into a valuable resource.

Type of Pirina:

A. Small size Pirina so called “Pellets” (Approx. 2 cm):

Dark brown color and dry is the best quality; the second quality is light brown, and the humidity percentage is higher than 15%. Free of sand and impurities.

B. Normal

Well pressed, free of sand and impurities, the humidity percentage must not exceed 15%. This form of Pirina is cylindrical, about 20 cm in length, and with an outer diameter of approximately 10 cm a Pirina cylinder can have an inner diameter of about 1 cm, or have not inner hole. The type with a hole is better as the burning process is quicker.



*Normal Pirina on the left –
small-size Pirina on the right)*

The impact of using Pirina in humanitarian response:

- **Community Empowerment:** The initiative empowered local communities by providing them an active role in sourcing and utilizing bio-waste for heating.
- **Environmental Stewardship:** Residents expressed satisfaction in contributing to environmental conservation by reducing agricultural waste and deforestation.
- **Fuel Accessibility:** Using Pirina significantly increased access to heating fuel, benefiting thousands of households in NW Syria.
- **Economic Relief:** Families reported reduced financial strain as Pirina was readily available at minimal or no cost.

Beneficiary feedback:

"Pirina heating has been a blessing. We don't have to worry about the cold anymore, and it feels good to use something local." - Aisha, a beneficiary.

"This initiative not only warms our homes but also warms our hearts knowing we are part of a sustainable solution for our community." - Mahmoud, a community member.

"Abu Ghassan no longer worries about his children who suffer from the cold. Their lives are a little easier now that they can sleep somewhere warm". Abu Ghassan, a beneficiary.

"The olive initiative is a game-changer for us. We can now keep our homes warm without worrying about the cost." - Fatima, a beneficiary.

"It feels good to be part of something that not only helps us but also takes care of our environment. We are proud to contribute." Ahmed, a community member.

Expected challenges in such project:

- **Modified stove:** the stove needs to be modified as the temperature of the Pirina is high and must be engineered to efficiently burn olive pits, which might include features for handling the specific burning characteristics and ash residue of olive pits. The metal thickness is usually higher than the normal stove. The pipes are similar to normal stoves, the materials need to withstand high temperatures. However, the corrosion characteristics might be different due to the unique ash and smoke composition of olive pits.
- **Production process:** The process of converting Pirina into adequate heating fuel requires technical expertise. Collaborative workshops and training sessions must be organized to educate the community on the best practices. Preferred to be produced from the previous season to have it dried well, as the moisture percentage must not exceed 15%.
- **Logistics Challenges:** Transportation and distribution logistics need to be well organized with enough laborers to manage the distribution process.
- **Market Capacity:** in the case of huge quantities requested from the local market, this may lead to price increases, which will affect the market and non-beneficiaries. Market assessment and market monitoring need to be well planned.

Mercy-USA Projects:

Mercy-USA has been implementing winterization projects by using olive-pit biomass fuel since 2015.

To date, Mercy-USA has provided winterization assistance to 37,594 HH (211,053 individuals) by distributing 26,878 Metric Tons of olive-pit fuel. On average each household receives a total of 750 kg of olive pit fuel divided by three rounds “250kg each round monthly” during the winter months “Nov, Dec, Jan” or “Dec, Jan, Feb”.

The initial fuel distribution normally occurs along with the stoves’ distribution or shortly after distributing the stoves to 100% of the targeted households to ensure all beneficiaries have the appropriate stoves to use olive-pit fuel.