CRITICAL FACTORS DETERMINATION
FOR QUALITY IMPROVEMENT OF PATCHOULI OIL
IN WEST PASAMAN REGENCY

FINAL PROJECT REPORT

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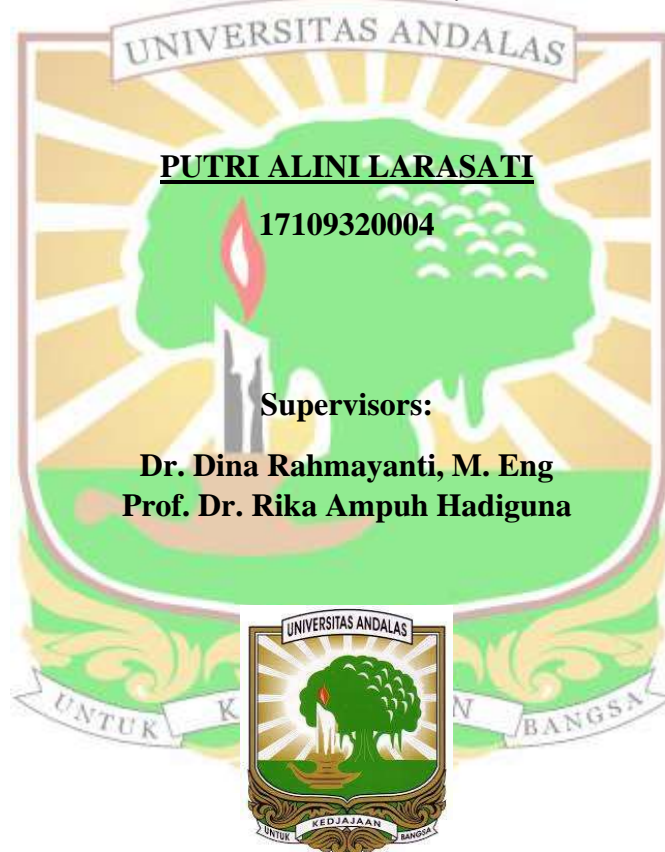# IN WEST PASAMAN REGENCY

FINAL PROJECT REPORT

A report submitted in fulfillment of the requirement for the award of the degree of Bachelor in Department of Industrial Engineering, Faculty of Engineering, Andalas University

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ABSTRACT

Patchouli oil is one type of essential oil, a substance obtained from the extraction of the stems and leaves of the patchouli plant. Based on the spatial plan for the West Sumatera region in 2012-2032, patchouli oil is a leading industry that should develop. West Pasaman Regency is the central area of a patchouli oil producer. However, based on previous research data, it is known that the quality of patchouli oil in the West Pasaman Regency is not following the standards and even rejected by the exporter. This condition certainly affects the value of exports and Indonesia's position as a world essential oil producer.

Various factors influence the quality of patchouli oil decrease. SNI has set the quality standard of patchouli oil, but the quality standard of patchouli oil in each supply chain actor is different. This study aims to determine the recommendation of improving the patchouli oil quality based on the critical factors, starting with determining the quality standard of patchouli oil according to the exporter. The factors get from literature studies, interviews, and questionnaires with patchouli oil's supply chain actors and expert's perspectives. The fuzzy AHP method is used to determine the factors that most influence the quality of patchouli oil, and the TRIZ method is used to determine the recommendations for improving the quality of patchouli oil based on the critical factors. The results of this study will be an initial recommendation for improving the quality of patchouli oil.

Based on the research results, the factors and sub-factors that affect the quality of patchouli oil in the West Pasaman Regency, there are four factors with 20 sub-factors. The level of factors that affect the quality of patchouli oil sequentially is the distillation process (weight 0.453), drying process (weight 0.208), packaging and storage (weight 0.180), and harvesting process (weight 0.160). The more high-value state, the more factor or subfactor affects the quality and vice versa. At the same time, the factors that most influence the quality of each factor are the age of harvest, drying method, length of time for the distillation process, and not being in contact with air. Critical factors and subfactors get recommendations for improvement by the TRIZ principle, and based on problems in the field such as the use of dark glass bottles, jugs, HDPE plastic canisters for patchouli oil packaging, the drying process is carried out by hanging patchouli with wind dry method, using *Pogostemon cablin* seeds from trusted sources, sorting the patchouli by seeing and touching the leaves, counseling for patchouli farmers to recognize the distillation process, underground oil storage, and use a timer for the accuracy of the distillation process.

Keywords: *Patchouli Oil, Patchouli oil quality, Critical Factor, Fuzzy AHP, TRIZ*

ABSTRAK

Minyak nilam merupakan salah satu jenis minyak atsiri, yaitu zat yang diperoleh dari hasil ekstraksi batang dan daun tanaman nilam. Berdasarkan Rencana tata ruang wilayah sumatera barat tahun 2012-2032, minyak nilam merupakan industri unggulan yang patut dikembangkan. Kabupaten pasaman barat merupakan daerah utama penghasil minyak nilam. Namun, berdasarkan data penelitian terdahulu diketahui kualitas minyak nilam kabupaten pasaman barat tidak sesuai dengan standar dan bahkan ditolak oleh pihak eksportir. Hal ini tentunya berpengaruh pada nilai ekspor dan posisi Indonesia sebagai produsen minyak atsiri dunia.

Penurunan kualitas minyak nilam tentunya dipengaruhi oleh berbagai macam Factor. Standar kualitas minyak nilam telah ditetapkan oleh SNI, namun standar kualitas minyak nilam dimasing-masing pelaku rantai pasok berbeda-beda. Penelitian ini bertujuan untuk menentukan rekomendasi perbaikan mutu kualitas minyak nilam berdasarkan Factor yang paling mempengaruhi (Factor kritis) dimulai dengan mengidentifikasi standar mutu kualitas minyak nilam menurut pihak eksportir. Factor yang mempengaruhi diperoleh melalui studi literatur, wawancara, dan kuesioner menurut para pelaku rantai pasok minyak nilam dan expert. Metode fuzzy AHP digunakan untuk mendapatkan Factor yang paling mempengaruhi kualitas minyak nilam dan metode TRIZ digunakan untuk menentukan rekomendasi-rekomendasi perbaikan mutu kualitas minyak nilam berdasarkan Factor yang paling mempengaruhi. Hasil penelitian ini akan menjadi rekomendasi awal untuk perbaikan kualitas minyak nilam.

Berdasarkan hasil dari penelitian yang dilakukan, didapatkan factor dan subfactor yang mempengaruhi kualitas minyak nilam di Kabupaten Pasaman Barat sebanyak 4 faktor dengan 20 subfaktor. Tingkat faktor mempengaruhi kualitas minyak nilam secara berurutan yaitu proses destilasi (bobot 0,453), pengeringan nilam (bobot 0,208), pengemasan dan penyimpanan (bobot 0,180), dan proses panen (bobot 0,160). Semakin besar bobot, semakin besar faktor tersebut mempengaruhi kualitas, dan sebaliknya. Sedangkan faktor yang paling mempengaruhi kualitas pada masing-masing faktor yaitu umur panen, metode pengeringan, lama proses destilasi, dan tidak kontak dengan udara. Faktor dan subfactor kritis mendapatkan rekomendasi perbaikan sesuai dengan prinsip TRIZ dan berdasarkan permasalahan dilapangan seperti menggunakan botol kaca gelap, kenci, jirigen plastic HDPE untuk pengemasan minyak nilam, proses pengeringan dilakukan dengan menggantung nilam, menggunakan biji dari jenis nilam Pogostemon cablin dari sumber terpecaya,melakukan penyortiran nilam dengan melihat dan menyentuh daun, penyuluhan untuk petani nilam mengenali proses destilasi, penyimpanan minyak bawah tanah, dan menggunakan timer untuk keakuratan proses destilasi.

Kata Kunci: Minyak Nilam, Kualitas Minyak Nilam, Factor Kritis, Fuzzy AHP, TRIZ