RANCANG BANGUN INDUSTRI TEPUNG LIDAH BUAYA (*Aloe vera*) TERPADU

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ABSTRACT

Technology to produce Aloe vera powder has been implemented in Aloe vera centre (AVC), Pontianak, West Kalimantan in pilot-plant scale. Based on chemical analysis and biological activity test, Aloe vera powder can be used to formulate cosmetic, food and pharmaceutical products such as lotion, shampo, soap, food supplement, sun burn cream and healing. Based on AVC technology pilot plant, research on designing an integrated Aloe vera powder industry has been conducted with system approach which the aim was to establish its decision supporting system and design engineering of Aloe vera industry in optimum scale. The research finding indicated that the application of system was able to synthesize ideas of interdiciplines; therefore it would improve the effectiveness of decision-making integratively. The research produced decision-supporting system model of integrated Aloe vera powder industry that accommodate the needs of stakeholders and should be effectively used by the decision makers facing dynamic change and information development. The research also produced process engineering flow diagram and layout of Aloe vera industry plant at economic optimum capacity. These models includes the evaluation of the best Aloe vera product, the best location of industry, material and energy balance, choise of specification of apparatus. This model can analyze the feasiability of Aloe vera powder industry in various capacities and optimize the economic capacity scale. To prevent farmer from decreasing Aloe vera price, this model designed win-win solution cost between industry and farmer to keep sustainability of industry and increasing farmers income. This model can also calculate the farm to save industry in raw material sustainability. Financial analysis with case study in Aloe vera Centre, Pontianak, West Kalimantan, shows that optimum capacity 25 ton powder/year, raw material 1852 ton Aloe vera/year (minimum farm 26 ha) with yield 1,35%, production periode 8 hours/day, 240 days/year and feasible with Pay Back Period 4,04 years, Break Even Point 13,568 ton powder/year, Net B/C 2,00, IRR 36,96% and feasible.. Win-win solution price of Aloe vera Rp.1100,-/kg Aloe vera. Sensitivity analysis shows that limit of decreasing product price 26.43% from normal price and limit of increasing raw material price Rp.3400/kg Aloe vera (normal price Rp.1100,-).

Keywords : design, model, decision supporting system, integrated aloevera powder industry.

PENDAHULUAN

Lidah buaya (*Aloe vera)* merupakan salah satu tanaman obat yang banyak digunakan dalam industri farmasi, terutama dalam sediaan kosmetik. Hal ini didasarkan pada fakta bahwa khasiat lidah buaya sebagai bahan baku kosmetik disebabkan karena adanya bahan aktif yang mempunyai khasiat farmakologis. Kandungan senyawa kimia yang terdapat di dalamnya, antara lain asam amino, karbohidrat, lemak, air, vitamin, mineral, enzim, hormon dan senyawa lainnya seperti saponin, antrakuinon, kuinon, lignin dan golongan enzim yaitu enzim sellulase, amilase, protein dan *biogenik simulator* (Marwati & Hermani 2006). Senyawa-senyawa tersebut mempunyai fungsi yang cukup beragam, antara lain sebagai antibiotik, antiseptik, antibakteri, antivirus, anti jamur, anti infeksi, anti peradangan dan anti pembengkakan. Secara spesifik, dalam khasiatnya sebagai sediaan kosmetik, saponin berkhasiat sebagai antiseptik, antrakuinon dan kuinon berkhasiat sebagai antibiotik dan merangsang pertumbuhan sel baru, lignin berkhasiat sebagai pelembab, aloin untuk merangsang pertumbuhan rambut, dan enzim sellulase, amilase, protein dan *biogenic simulator* sebagai zat aktif membantu metabolisme dan merangsang pertumbuhan dan regenerasi sel kulit. Dalam pemanfaatannya sebagai bahan baku kosmetik, lidah buaya diformulasikan untuk pengobatan dan perawatan kulit (kulit yang terbakar, iritasi, jerawat, melembabkan kulit, pelindung kulit dari sinar matahari) dan perawatan rambut (anti ketombe, melembabkan rambut, merangsang pertumbuhan rambut). Bentuk produk kosmetik dan *personal care* yang dikembangkan dari lidah buaya antara lain shampo, tonik, sabun, *lotion*, krim, pasta gigi.

Di Kalimantan barat, khususnya daerah Siantan Hulu, Pontianak, tanaman lidah buaya merupakan tanaman produksi alternatif sebagai mata