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SOCIALIZATION OF DISHWASHING SOAP MAKING AS AN ALTERNATIVE TO INCREASE SKILLS AND BUSINESS OPPORTUNITIES FOR THE COMMUNITY IN KELURAHAN WEK II, KECAMATAN BATANGTORU

SOSIALISASI PEMBUATAN SABUN CUCI PIRING SEBAGAI ALTERNATIF UNTUK MENINGKATKAN KETERAMPILAN DAN PELUANG USAHA BAGI MASYARAKAT DI KELURAHAN WEK II, KECAMATAN BATANGTORU

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Abstract

This Community Service (PkM) activity aims to increase knowledge, improve household expenditure efficiency, and provide practical skills to residents of Kelurahan Wek II, Kecamatan Batangtoru, South Tapanuli Regency, through training on self-produced dishwashing soap. The high reliance of the community on branded commercial cleaning products leads to elevated monthly family expenditures. On the other hand, the potential of human resources, particularly the PKK women's group and housewives, has not been optimally utilized in productive economic activities. The execution method used a systematic participatory approach, encompassing preparation and coordination, technical material dissemination, interactive demonstrations, independent practice, and program effectiveness evaluation. The results showed an increase in participants' technical understanding of raw material formulations (such as Texapon, NaCl, colorants, and aromatics), homogeneous mixing techniques, solution settling, and packaging standards. In addition to positively impacting household budget efficiency, this activity was proven to foster public entrepreneurial interest in using these new skills as a foundation for launching home industries in the local area.

Keywords : Dishwashing Soap, Practical Skills, Economic Efficiency, Business Opportunities, Community Service, Kelurahan Wek II.

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Abstrak

Kegiatan Pengabdian kepada Masyarakat (PkM) ini bertujuan untuk meningkatkan pengetahuan, memperbaiki efisiensi pengeluaran rumah tangga, serta membekali warga Kelurahan Wek II, Kecamatan Batangtoru, Kabupaten Tapanuli Selatan, dengan keterampilan praktis dalam memproduksi sabun cuci piring secara mandiri. Tingginya ketergantungan masyarakat terhadap produk pembersih komersial bermerek menyebabkan besarnya pengeluaran bulanan keluarga. Di sisi lain, potensi sumber daya manusia khususnya kelompok PKK dan para ibu rumah tangga belum dimanfaatkan secara optimal dalam kegiatan ekonomi produktif. Metode pelaksanaan yang digunakan adalah pendekatan partisipatif sistematis, yang mencakup tahap persiapan dan koordinasi, penyampaian materi teknis, demonstrasi interaktif, praktik mandiri, serta evaluasi efektivitas program. Hasil kegiatan menunjukkan adanya peningkatan pemahaman teknis peserta mengenai formulasi bahan baku (seperti Texapon, NaCl, pewarna, dan pewangi), teknik pencampuran hingga homogen, proses pengendapan larutan, serta standar pengemasan. Selain memberikan dampak positif terhadap efisiensi anggaran rumah tangga, kegiatan ini terbukti mampu menumbuhkan minat kewirausahaan masyarakat untuk memanfaatkan keterampilan baru tersebut sebagai landasan dalam merintis industri rumahan di wilayah setempat.

Kata Kunci : Sabun Cuci Piring, Keterampilan Praktis, Efisiensi Ekonomi, Peluang Bisnis, Pengabdian Masyarakat, Kelurahan Wek II.

1. INTRODUCTION

Higher education institutions have a moral and academic obligation to meaningfully contribute to community development through the implementation of the Tri Dharma of Higher Education, where community service acts as a crucial bridge connecting academic theoretical advancements with empirical needs in the field. Non-formal education initiatives and technical skills empowerment are vital instruments for academic institutions to transfer practical knowledge aimed at solving daily problems faced by local communities. Within the scope of micro-scale social and economic empowerment, strengthening the technical capacity of women's organizations and housewives plays a strategic role in bolstering long-term family financial stability.

Kelurahan Wek II, located in Kecamatan Batangtoru, South Tapanuli Regency, is a developing residential area with dense household activities and an active community network. Based on a comprehensive field observation and initial problem mapping conducted by the KKN Team of Institut Pendidikan Tapanuli Selatan, the primary economic challenge identified was the high dependence of local households on branded commercial cleaning products, particularly liquid dishwashing detergent. As fast-moving consumer goods (FMCG), dishwashing soap is essential for maintaining kitchen hygiene and daily food safety standards. However, continuous purchases of packaged products from major manufacturers consume a significant portion of routine monthly household budgets.

This recurring financial burden is exacerbated by several fundamental structural limitations within the community. First, there is a low level of household chemical literacy, creating a perception among residents that detergent manufacturing requires sophisticated industrial machinery or hazardous chemicals inaccessible to laypeople. In reality, effective liquid soap can be safely synthesized using simple, non-toxic, and affordable chemicals available on the open market. Second, housewives and PKK members in Kelurahan Wek II lack practical experience in precise raw material measurement, stirring techniques, liquid stabilization, and product packaging. Third, the vast potential of the local neighborhood market has not been utilized as a foundation to establish independent home industries.

To address these interrelated challenges, the Community Service Team designed a comprehensive program titled "Socialization and Training on Independent Dishwashing Soap Making as an Alternative to Increase Skills and Business Opportunities." The main goals of this program

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encompass two interdependent aspects. From an educational and technical skill perspective, the program aims to provide theoretical instruction and direct laboratory practice to empower residents to independently produce high-quality, viscous, and safe liquid detergent. From an economic perspective, the program aims to prove that self-production can reduce household cleaning expenditure by more than half while inspiring women to start micro-businesses and leverage local community networks for economic sustainability.

2. RESEARCH METHOD

This community service activity was centered at the Wek II Sub-district Office Hall, Kecamatan Batangtoru, South Tapanuli Regency, a location chosen due to its strategic accessibility for local PKK members, health cadres, and housewives. The program implementation methodology adopted a Participatory Technology Transfer (PTT) approach, ensuring that target beneficiaries were transformed from passive listeners into active practitioners throughout the learning process. The activity methodology was organized sequentially into four functional stages, starting from preparation and needs analysis, followed by theoretical socialization, progressing to direct practical demonstrations, and concluding with product evaluation and packaging trials.

Table 1. ***Dishwashing Soap Formulation Composition (10-Liter Scale)***

No	Raw Material Name	Primary Function	Standard Quantity	Special Notes
1	Texapon (SLES)	Primary surfactant / Foamer and degreaser	1.000 gram (1 kg)	Clear paste texture
2	NaCI (Pure Salt)	Thickening agent and stabilizer	1.000 gram (1 kg)	Must be finely sieved
3	Fragrance (Lemon)	Provides a refreshing aroma / Removes fishy odors	20 mL	Pure concentrate quality
4	Liquid/Natural Colorant (Green)	Esthetic product coloring	As needed (± 5 mL)	Food/soap grade specific
5	Water	Primary solvent (solvent)	8-9 Liters	Free of high minerals / Boiled water

In this training, the taught formulation was specifically designed for easy home-scale execution. Table 1 details the standard recipe composition used to produce ± 10 Liters of high-quality dishwashing soap.

In the initial planning phase, the KKN Team conducted administrative coordination with the Head of Keluirahan Wek II and core PKK administrators to align schedules and organize participant logistics. Alongside this coordination, the team procured household-grade chemical ingredients including Texapon (Sodium Lauryl Ether Sulfate/SLES) as the primary surfactant, pure salt (NaCl) as a viscosity modifier/thickener, food-grade green liquid dye, concentrated lemon fragrance oil, and clean water. Mechanical equipment such as large mixing containers, uniform wooden stirrers, volumetric measuring cups, pouring funnels, and polyethylene terephthalate (PET) plastic bottles were prepared together with practical guide modules containing precise recipe measurements, procedural steps, and troubleshooting guidelines to anticipate mixing errors.

The second stage focused on theoretical socialization delivered through an interactive educational seminar. Presenters detailed the specific chemical function of each raw material,

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explaining how Texapon acts as an amphiphilicn compound binding non-polar fat molecules while generating foam, and how NaCl acts as an electrolyte triggering the enlargement of Texapon micelles to increase liquid viscosity. In addition to chemical fundamentals, presenters delivered a comparative financial analysis contrasting the cost of production of self-made formulations against market retail prices of branded commercial products, explicitly demonstrating potential household budget savings.

The third stage involved interactive demonstrations and small group exercises where participants practiced the complete preparation sequence under direct supervision. Participants mixed Texapon and NaCl in a dry container until a thick white paste was formed, gradually added measured amounts of water while continuously stirring in one direction to prevent phase separation and excessive aeration, and concluded with the integration of fragrance oil and green dye. The final stage included a two-tiered evaluation comprising a physical product quality assessment (checking visual clarity, aroma distribution, and viscosity stability after a 24-hour settling period) and a participant feedback survey measuring material retention, procedural confidence, and entrepreneurial interest.

3. RESULT AND DISCCUSSION

This community service program was successfully conducted on Wednesday, August 5, 2026, at the Wek II Sub-district Office Hall, attended by 35 female participants including PKK cadres, Posyandu cadres, and local housewives. The training utilized a standard recipe formula optimized for a 10-liter yield, combining 1,000 grams of Texapon paste, 800 to 1,000 grams of finely sieved pure NaCl, 15 to 20 milliliters of lemon fragrance concentrate, 5 milliliters of food-grade green dye, and approximately 8 to 9 liters of clean water. This specific formulation was selected to guarantee high grease-cutting power, appealing esthetics, and stable shelf life without requiring complex industrial additives.

The physical manufacturing procedure practiced by participants took place across five structured technical stages. First, the Texapon paste and pure NaCl were placed into a dry mixing container and intensively ground using a single-direction wooden stirrer. This initial mechanical stirring triggered an immediate chemical reaction, converting the originally clear surfactant paste into a thick white creamy mass due to salt-ion interactions altering the Texapon micellar structure. Single-direction stirring was strictly enforced during this stage to prevent trapping external air into the mixture, which could form excessive microscopic foam and impede complete dissolution.



Figure 1. ***Direct Assistance in Dishwashing Soap Making and Packaging Practice by the KKN Team***

The process of direct guidance by KKN students demonstrating mixing techniques and packaging liquid dishwashing soap into bottles alongside participants can be seen in Figure 3.1. This close interaction ensured participants understood measurement accuracy and correct stirring techniques.

Second, clean water was poured into the thick creamy mass slowly and incrementally in small volumes while stirring continuously. Gradual water addition allowed the hydrophobic and hydrophilic groups of the surfactant to evenly bind water molecules, slowly diluting the dense mixture into a

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homogeneous, viscous liquid. Participants learned that pouring large volumes of water all at once could disrupt micellar bonding, causing Texapon to form slippery clumps and resulting in a watery end product.

Third, after complete dissolution, the pre-dissolved green dye and lemon fragrance concentrate were added to the mixture. The solution was stirred for an additional fifteen minutes to ensure uniform dispersion of color molecules and aromatic oils throughout the liquid. Fourth, because mechanical stirring introduced fine air bubbles causing the liquid to appear cloudy, the soap solution was tightly sealed and left undisturbed for 24 hours for a settling process. This settling phase allowed air bubbles to rise to the surface and dissipate naturally, leaving behind a clear, thick, green dishwashing soap with a stable texture. Finally, the settled liquid soap was poured via funnels into 450 mL and 500 mL PET plastic bottles, tightly capped, and labeled with packaging stickers.

Evaluations conducted following the practical session showed significant improvements in participant skills, household economic efficiency, and local entrepreneurial perspectives. Before the training, 85% of participants were unaware that pure table salt serves a technical function as a thickening agent in liquid detergent manufacturing. Post-training assessments confirmed that 100% of participants mastered the sequence of ingredient addition, understood the chemical functions of each component, and successfully produced a batch of high-viscosity dishwashing soap independently.i.

Table 2. ***Self-Production Cost (10-Liter Scale)***

No	Nama Bahan Baku	Harga
1	Texapon (1 kg)	Rp30.000
2	NaCI/Pure Salt (1kg)	Rp10.000
3	LemonFragrance	Rp-0
4	Liquid/Natural Colorant (Pandan)	Rp-0
5	Plastik Packaging Bottles	Rp70.000

From a financial perspective, the program successfully demonstrated the economic benefits of self-production. Making 10 liters of soap required Rp30,000 for Texapon, Rp10,000 for NaCl, and Rp70,000 for plastic packaging bottles, yielding a total production cost of approximately Rp110,000. This equals a cost of production of Rp10,000 per liter, far below market retail prices for branded commercial dishwashing soap, which range from Rp22,000 to Rp26,000 per liter. By switching to self-production, families in Wek II Sub-district can reduce kitchen cleaning expenses by 55% to 60% each month, allowing those funds to be redirected toward other primary needs such as nutrition, healthcare, and children's education. Furthermore, the product's thick consistency, fresh aroma, and strong cleaning power motivated PKK leadership to explore forming a Joint Business Group (KUB) to produce and market the soap commercially at the local level.



Figure 2. ***Group Photo of KKN Team and Training Participants Displaying the Final Dishwashing Soap Products***

DISCUSSION

The execution of this community service program based on self-produced dishwashing soap training proved the effectiveness of a participatory approach in bridging real household economic

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needs with micro-technical skill empowerment. The direct involvement of participants from PKK groups and housewives in Kelurahan Wek II not only transferred practical knowledge but also shifted public perception regarding household cleaning chemicals, which had previously been viewed as complex and expensive. This aligns with the concept of micro-scale vocational education, where mastering daily product manufacturing procedures independently enhances self-efficacy and economic self-reliance.

From a budget efficiency perspective, reducing expense burdens by up to 60% is a crucial finding directly impacting family financial resilience. Reliance on manufactured branded cleaning products often acts as a hidden cost eroding daily consumption budgets. By making soap independently, funds previously spent on commercial products can be reallocated to higher-priority needs such as nutrition and education. These results reinforce prior studies stating that community-based household cleaner production training effectively drives household financial efficiency in developing areas.

Technically and scientifically, direct interaction during demonstrations and hands-on practice proved effective in boosting practical chemical literacy. Participants' understanding of Texapon as a surfactant and NaCl as a micelle-enlarging electrolyte (viscosity modifier) provided a clear scientific framework accessible to laypeople. Participants' success in producing soap with optimal viscosity, color, and fragrance demonstrates effective technology transfer. Simple quality control, such as the 24-hour settling process to eliminate air bubbles, taught the importance of quality standards in household product manufacturing.

From a social and entrepreneurial standpoint, this activity served as a catalyst for fostering entrepreneurship at the sub-district level. The push from PKK administrators to advance toward establishing a Joint Business Group (KUB) indicates that the program went beyond a ceremonial event, offering potential to create a sustainable home industry business unit. Potential future hurdles, such as securing a steady chemical supply chain and standardizing packaging, can be mitigated through regular coordination with sub-district officials and digital marketing assistance in future service programs.

4. CONCLUSION

The Community Service (PkM) program featuring dishwashing soap training in Kelurahan Wek II, Kecamatan Batangtoru, was successfully executed and demonstrated a significant positive impact on local community capacity. Through a structured participatory approach, the program successfully transferred practical scientific knowledge and technical skills to local PKK groups and housewives. Participants not only understood physical mixing procedures but also mastered basic principles of simple chemical formulations such as the roles of surfactants and thickening electrolytes enabling them to independently produce thick, fresh smelling dishwashing soap with stable cleaning power.

From a financial efficiency standpoint, this self-production innovation offered a concrete solution to reduce routine kitchen cleaning expenses by up to 60% compared to purchasing branded commercial products on the market. This daily shopping budget savings directly provides greater financial flexibility for families to allocate funds toward priority sectors such as nutrition, healthcare, and children's education. Thus, the program impacted not only technical vocational skills but also contributed meaningfully to strengthening household economic resilience at the sub-district level.

Beyond domestic efficiency benefits, the high quality of products generated during training sparked collective motivation and entrepreneurial interest among participants. These new skills hold potential economic value for further development into micro-home industry business units. The commitment demonstrated by local PKK leaders to explore creating a Joint Business Group (KUB) indicates that this service activity succeeded in cultivating community economic independence and creating new employment opportunities in Kelurahan Wek II.

To sustain program impact, ongoing synergy is required between the community, local government, and academics. The Kelurahan Wek II PKK group is encouraged to organize collective

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production to meet local consumption needs while preparing steps toward business initiation. The Kelurahan Wek II Government is advised to provide support through initial capital facilitation, micro-business permitting assistance, and product integration into regional MSME exhibitions. Meanwhile, future community service teams are recommended to deliver advanced mentoring covering laboratory quality standards testing (such as pH and skin irritation tests), professional packaging design (branding), and digital marketing training to expand market reach professionally and broadly.

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