

Strengthening Women's Entrepreneurial Capacity through Banana Chip Production in Kalongan Village, Semarang Regency

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ABSTRACT

This community service program aimed to strengthen women's entrepreneurial capacity by developing banana chip production as a local economic product in Kalongan Village, Semarang Regency. It sought to empower women by improving practical skills in processing local agricultural resources into value-added products supporting household income and community-based entrepreneurship. The program used Participatory Action Research (PAR), involving 30 women selected through purposive sampling from the SEPATAH KATA community. Implementation proceeded through four stages: socialization of program objectives, training in banana chip production techniques, intensive mentoring during production, and evaluation of learning outcomes. A Likert-scale questionnaire assessed production accuracy, cooperation during production, and participants' independence and consistency. Data were analyzed descriptively using percentage analysis. Results showed positive impacts on participants' entrepreneurial skills and behavior: increased independence and consistency in production (45%), improved cooperation during production (30%), and better understanding of production procedures and step accuracy (25%). Participants also grasped the production stages and actively engaged in collaborative learning. These findings indicate that participatory training combined with continuous mentoring effectively enhanced participants' practical skills in transforming local resources into marketable products. The program successfully strengthened women's entrepreneurial capacity and supported the development of banana chip production as a sustainable local enterprise. Future follow-up efforts are recommended to focus on digital marketing assistance, product legality certification, improved packaging design, and sustainability monitoring of women's business groups.

Keywords: banana chip production, community empowerment, local entrepreneurship, participatory training, women entrepreneurship

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INTRODUCTION

Women's empowerment is a strategic issue in both national and global development agendas due to its significant role in improving family welfare, alleviating poverty, and strengthening community economic resilience (Akter et al., 2024; Rilasya & Sari, 2025). Women not only contribute to the domestic sphere but also have great potential as economic actors capable of driving the micro and small business sector, especially in rural areas. Strengthening women's capacity through entrepreneurship based on local potential is seen as an effective and sustainable approach to promoting inclusive economic development (Sugiharto & Veronica, 2025).

Issues surrounding women's involvement in productive economic activities still face various structural and cultural challenges. Low levels of education and entrepreneurial skills, limited access to capital and technology, and a lack of business support mean that women are not yet fully able to take advantage of existing economic opportunities (Wardana et al., 2020). This situation is further exacerbated by the persistence of traditional gender roles that place women in the domestic sector, resulting in their participation in economic activities often being informal and low-income (Zemlyak et al., 2023).

The limited participation of women in productive economic activities also has a direct impact on their low contribution to improving family welfare and rural economic development (Apandi et al., 2022). When women do not have adequate access to economic resources, dependence on the main household income increases, making families more vulnerable to economic shocks (Jabeen et al., 2020). This condition shows that strengthening women's economic role not only has implications for individuals but also affects the overall social and economic stability of society.

On the other hand, villages in Indonesia actually have great potential in terms of local resources that can be developed into productive entrepreneurial economic activities. Agricultural commodities, garden produce, and local food products can be processed into value-added products that can increase community income (Arintyas, 2024). However, this potential is often not optimally utilized due to limitations in knowledge, innovation, and business management skills, especially among women. Without targeted intervention, this local potential risks being exploited only in traditional ways and failing to have a significant economic impact (Ishak, 2024).

Kalongan Village, Semarang Regency, is one of the areas with abundant natural resources, especially bananas (Kurnianingtyas, 2023). Bananas are agricultural products that are easily found and available throughout the year, but their use is still limited to household consumption or sale in raw form with relatively low economic value. The lack of innovation in post-harvest processing means that the economic potential of bananas has not had a significant impact on increasing community income, especially for women (Sari et al., 2024). On the other hand, women in Kalongan Village play an important role in managing agricultural products and household economic activities. However, the absence of structured and sustainable empowerment programs means that this potential has not been optimally developed (Ayisha & Abdul Latip, 2023).

Based on preliminary observations, women in Kalongan Village still face limitations in their knowledge of product processing techniques, packaging, quality standards, and marketing strategies that are in line with market developments. As a result, opportunities to create value-added processed products that are able to compete in local and regional markets are hampered (Quick et al., 2022). Seeing this condition, the development of local entrepreneurship through the production of banana chips is a relevant and contextual alternative solution. Banana chips are a processed product that is relatively easy to

produce, has a long shelf life, and has a wide market opportunity (Sujinda et al., 2025). By processing bananas into chips, women are not only involved as workers but are also encouraged to play a role as independent and competitive entrepreneurs.

Considering these conditions, the Organizational Capacity Development Team of the Student Organization Development Program (PPK ORMAWA) of the Nonformal Education Student Association at Universitas Negeri Semarang initiated a community empowerment program to develop local entrepreneurship through banana chip production as a relevant and contextual alternative solution. Banana chips are a processed product that is relatively easy to produce, has a fairly long shelf life, and offers broad market opportunities (Luzuriaga-Amador et al., 2025). Through the processing of bananas into chips, women are not only involved as laborers but are also encouraged to take on roles as independent and competitive entrepreneurs (Surya et al., 2020).

The urgency of implementing a women's empowerment program based on local entrepreneurship through banana chip production lies in its ability to simultaneously address economic, social, and gender issues. This program is expected to improve women's skills and capacity, create new business opportunities, and strengthen family and village economies (Anggraeni & Sasono, 2025). In addition, this program also has the potential to encourage the formation of women's business networks, increase social solidarity, and support sustainable local economic development based on village potential (Yin et al., 2024). Thus, the empowerment of women through banana chip production in Kalongan Village, Semarang Regency, is not only an effort to increase income, but also a strategy for social transformation that places women as the main subjects of development. This approach is expected to create sustainable change and make a real contribution to strengthening the village economy.

Based on these conditions, this community service program aims to strengthen women's entrepreneurial capacity through participatory training and mentoring in banana chip production in Kalongan Village, Semarang Regency. Specifically, this program seeks to improve participants' technical skills in banana chip processing, enhance cooperation during the production process, and foster participants' independence and consistency in developing local entrepreneurial activities. The evaluation of this program focuses on measuring behavioral and skill changes experienced by participants after participating in the training and mentoring activities.

METHODS

The Student Organization Capacity Strengthening Program (PPK Ormawa) of the Student Association of the Nonformal Education Study Program, Universitas Negeri Semarang, carried out community service and empowerment activities with the theme Women's School in Kalongan Village, East Ungaran District, Semarang Regency, Central Java. The program was implemented for six months, starting from June 2023 until December 2023. However, the training on processed banana products was conducted for two weeks. The implementation of the PPK Ormawa method aims to improve the performance of higher education institutions in strengthening the capacity of student organizations so that they become competent, embody Pancasila values, and act as initiators of development in villages (Rangga Arifin et al., 2024).

The PPK Ormawa student team from the Student Association of the Nonformal Education Study Program, Universitas Negeri Semarang, collaborated with the village government, hamlet heads, members of the Family Welfare Empowerment (PKK), and other community elements to implement structured activities. The focus of this program was to encourage women, particularly mothers in Kalongan Village, to contribute to improving their capacity and abilities in a good, firm, and wise manner. This community

empowerment program involved 30 women participants who were members of the SEPATAH KATA community. Participants were selected using purposive sampling techniques based on several criteria: (1) women of productive age, (2) actively involved in community activities, and (3) interested in entrepreneurship development activities.

The method used in this community empowerment activity was the Participatory Action Research (PAR) approach (Leonard et al., 2025) where this program is implemented in several stages as shown in Table 1.

Table 1. Operational Description of Participatory Action Research (PAR)

PAR Cycle	Stage (Phase)	Objectives	Main Activities	Participants Involved	Output / Results
Planning (Plan)	Identify problems, needs, and plan actions collaboratively	- Identify the potential of banana as a local resource - Identify challenges faced by women in processing and marketing - Determine training needs and activity plans with participants	- Focus Group Discussion (FGD) with SEPATAH KATA community - Mapping local resources and opportunities - Identifying problems and formulating solutions together - Planning activity schedule, training materials, and evaluation instruments	PPK Ormawa Team, SEPATAH KATA community (30 women), Kalongan Village government, PKK members, hamlet representatives	Activity plan, agreement on program objectives, training plan, and evaluation instruments
Action (Act)	Implement actions (training and mentoring activities)	- Build participants' skills in banana chip production - Strengthen collaboration and participation - Encourage practical learning through direct practice	- Conducting banana chip production training (preparation, processing, seasoning, packaging) - Providing intensive mentoring during practice - Facilitating group discussions and problem solving - Encouraging active participation in each production stage	PPK Ormawa Team (as facilitator), SEPATAH KATA participants (30 women)	Increased skills and active involvement of participants in the banana chip production process
Observation (Observe)	Observe and collect data on the implementation process and its impacts	- Assess the implementation process - Measure the impact on participants' behavior and skills - Collect feedback for program improvement	- Observation during training and mentoring - Distributing post-test questionnaire (Likert scale) - Conducting informal interviews and discussion reflections - Documenting activities and products	PPK Ormawa Team, SEPATAH KATA participants (30 women)	Evaluation data on participants' skills, attitudes, and program impact
Reflection (Reflect)	Reflect on the results, evaluate, and plan improvements for the next cycle	- Analyze evaluation results together - Identify strengths and areas for improvement - Plan follow-up actions for sustainability	- Present evaluation results to participants - Joint reflection discussion (what worked, what needs improvement) - Formulate recommendations and follow-up plans together - Plan advanced training or market development	PPK Ormawa Team, SEPATAH KATA community, Kalongan Village government, PKK members	Program improvement recommendations and action plan for sustainability

First, the dissemination of information or dissemination of the objectives of women's empowerment based on local entrepreneurship, followed by the reasons for choosing bananas as the main project for empowerment in Kalongan Village. This was done in order to build participation and communication among participants or the community in participating in these empowerment activities (Laga Hae & Nugroho, 2021). Furthermore, in the process of conveying this information, the reasons for choosing bananas as the main commodity in empowerment activities in Kalongan Village were also explained. The choice of bananas was based on the abundant availability of raw materials in the surrounding environment, ease of processing, and high economic value potential when processed into value-added products, such as banana chips (Ridwansyah et al., 2021).

The second is training in making banana chips, where participants will be given training in processing banana chips, including:

1. Raw material selection technique, which involves choosing the right bananas to make chips. Usually, bananas that are half-ripe or old but not too ripe are used, such as kepok bananas or horn bananas. Selecting good raw materials ensures that the chips have a crispy texture and do not break easily when fried.
2. Peeling technique, which involves peeling the selected bananas and slicing them thinly. Slicing can be done manually using a knife or using a special slicing tool (slicer) to ensure uniform thickness. The thickness of the slices affects the crispiness of the chips.
3. Soaking technique, which involves soaking the bananas in a salt water or lime water solution for several minutes. This technique aims to preserve the color of the bananas, so they do not quickly turn brown and help produce a crispier texture after frying.

4. Frying technique, which involves frying the bananas in a sufficient amount of hot oil at a stable temperature. The bananas are fried until they turn golden yellow and become dry and crispy in texture.
5. Oil extraction techniques, this technique aims to reduce the oil content in chips so that the product quality is better and more durable.
6. Techniques for Adding Seasonings, Once the chips have cooled, various flavors can be added, such as caramel, chocolate, chili, cheese, or other sweet flavors. The addition of these seasonings aims to enhance the taste and appeal of the product.
7. Packaging Techniques, the final stage is packaging using airtight plastic or standing pouch packaging to keep the chips crispy, hygienic, and have a higher selling value.

The third is to provide intensive assistance to participants after they have completed the training activities. At this stage, participants receive both direct and indirect assistance for one week. This assistance is provided to ensure that participants are able to apply the knowledge and skills they have acquired during the training in the production process. In addition, this assistance also aims to ensure that the products produced are of good quality and meet the established standards (Saputra et al., 2026).

The fourth stage is evaluation, which will be conducted at the end of the activity by measuring the participants' achievement in banana chip making skills. The evaluation will be carried out using a questionnaire to determine the extent to which participants feel the benefits of the training and can apply the skills they have acquired in their daily activities. (Khamidah, 2025). The questionnaire contained forms on the perceived impact of accuracy in following the production steps, ability to cooperate during the production process and independence and consistency in production. The evaluation instrument used in this program was a structured questionnaire developed using a Likert scale ranging from 1–5 on Table 2 as follows.

Table 2. Evaluation Instrument Items

Indicator	Definition	Items (Statements) (10 items for each indicator)	Likert Scale (1–5)				
			1 (STS)	2 (TS)	3 (N)	4 (S)	5 (SS)
1. Accuracy in Following the Production Steps	The extent to which participants understand and correctly follow each stage of banana chip production in accordance with established procedures and standards.	1. I understand the sequence of banana chip production procedures systematically. 2. I am able to select raw banana materials according to production standards. 3. I can apply appropriate slicing techniques during the production process. 4. I understand the correct soaking and seasoning procedures before frying. 5. I am able to control frying temperature according to the recommended standards. 6. I can determine the appropriate frying duration to maintain product quality. 7. I understand proper oil-draining techniques after frying. 8. I am able to package banana chips according to hygiene and packaging standards. 9. I consistently follow all production stages in accordance with the training guidelines. 10. I can independently produce banana chips without procedural errors.	1	2	3	4	5
2. Ability to Cooperate During the Production Process	The extent to which participants can cooperate, communicate, and work together effectively with other members during the production process.	1. I actively participate in group activities during banana chip production. 2. I communicate effectively with other participants during the production process. 3. I am willing to share responsibilities with other group members. 4. I contribute ideas during discussions related to production activities. 5. I help other participants when they experience difficulties during production. 6. I maintain positive interaction and collaboration during teamwork activities. 7. I respect the opinions and suggestions of other participants during discussions. 8. I coordinate effectively with group members to complete production tasks. 9. I demonstrate responsibility in completing assigned group tasks. 10. I encourage collaborative problem-solving during production activities.	1	2	3	4	5
3. Independence and Consistency in Production	The extent to which participants can independently and consistently produce banana chips while maintaining quality and showing initiative in developing the business.	1. I am able to independently produce banana chips after participating in the training. 2. I consistently apply the production procedures taught during the program. 3. I am confident in continuing banana chip production activities independently. 4. I can solve simple production problems without facilitator assistance. 5. I demonstrate consistency in maintaining product quality during production. 6. I am motivated to continue developing banana chip production as an entrepreneurial activity. 7. I can manage production activities independently from preparation to packaging. 8. I am able to maintain consistency in production schedules and activities. 9. I show initiative in improving the quality of banana chip products. 10. I am committed to sustaining banana chip production as a local business opportunity.	1	2	3	4	5

Likert Scale Description	1 (STS)	2 (TS)	3 (N)	4 (S)	5 (SS)
Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Scoring	Score for each item: 1 (STS) – 5 (SS) Total score for each indicator = sum of all item scores				
Data Analysis	Percentage (%) = (Total score obtained / Maximum possible score) × 100% Where: Maximum possible score = 5 × number of items × number of respondents				
Interpretation Criteria	0% – 20% Very Low	21% – 40% Low	41% – 60% Moderate	61% – 80% High	81% – 100% Very High

Based on Table 2, the evaluation instrument items were designed to measure participants' competencies in banana chip production training through three main indicators: accuracy in following the production steps, ability to cooperate during the production process, and independence and consistency in production activities. Each

indicator consists of ten statement items assessed using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5).

The first indicator, accuracy in following the production steps, evaluates participants' understanding and ability to implement each stage of banana chip production according to established procedures and standards. The items assess participants' competencies in selecting raw materials, applying slicing techniques, controlling frying temperature and duration, understanding seasoning procedures, maintaining hygiene standards, and independently carrying out production activities without procedural errors (Ridwansyah et al., 2021). This indicator reflects the extent to which participants can systematically follow the technical procedures taught during the training program.

The second indicator, ability to cooperate during the production process, measures participants' capacity to collaborate effectively with other group members throughout production activities. The statement items focus on active participation, communication skills, responsibility sharing, contribution of ideas, teamwork, respect for others' opinions, coordination in completing tasks, and collaborative problem-solving abilities (Saputra et al., 2026). This indicator emphasizes the importance of social interaction and teamwork in achieving effective production outcomes.

The third indicator, independence and consistency in production, assesses participants' ability to independently sustain banana chip production activities while maintaining product quality and demonstrating entrepreneurial initiative. The items evaluate participants' confidence in conducting production independently, solving production problems without facilitator assistance, maintaining consistency in production schedules and product quality, and showing commitment to developing banana chip production as a local business opportunity (Mote et al., 2023). This indicator highlights the sustainability aspect of the training outcomes and participants' readiness to continue production activities beyond the program implementation.

The instrument applies to a scoring system in which the total score for each indicator is calculated by summing all item scores. Data analysis is conducted using percentage calculations based on the obtained score divided by the maximum possible score, multiplied by 100 percent. The interpretation criteria classify the results into five categories: Very Low (0–20%), Low (21–40%), Moderate (41–60%), High (61–80%), and Very High (81–100%).

RESULT AND DISCUSSION

Women's Empowerment

This empowerment activity involved 30 participants, most of whom were members of the SEPATAH KATA community or Sekolah Perempuan Tangguh Berkarya Cita (School for Strong Women with Ambitions), which is an outreach community of the PPK ORMAWA program of the Student Association of the Non-Formal Education Study Program at Universitas Negeri Semarang. Most of the community participants were women of productive age, namely 15–64 years old, from various hamlets in Kalongan Village. This community was formed with the hope that the community, especially women in Kalongan Village, could develop and build their capacity as an effort to prevent patriarchy.

Implementation of Program Activities

The implementation of the banana chip production program to foster local entrepreneurship was carried out over two weeks and divided into four activities. The first activity was a trial-and-error process, in which members of the Universitas Negeri Semarang Non-Formal Education Study Program Student Association conducted experiments in banana chip production. The aim was to find the most appropriate

formulation and processing techniques to produce a product with good quality and taste (Taşova, 2024).

The second activity is activity preparation, where the activity committee, which consists of members of the Association, prepares everything needed for participants who will later practice making banana chips as a form of local entrepreneurship. The third stage of the activity was to provide assistance in making banana chips, focusing on the manufacturing process, refinement, and final completion of the product. This activity used a direct, educational, and participatory approach based on the principles of participatory action research (Springett et al., 2023).

Banana Chips as a Local Entrepreneurial Product

Banana chips are one of the processed food products that have great potential to be developed as a form of local entrepreneurship based on natural resources available in the community (Astiko et al., 2025). In Kalongan Village, the abundant availability of bananas as raw materials presents an opportunity that can be utilized to produce value-added products through a simple processing method that has considerable market potential (Kisworo et al., 2022). Processing bananas into chips not only increases the economic value of the banana commodity, but also extends the shelf life of the product, making it easier to market. The implementation process of community empowerment activities can be seen in Figure 1.



Figure 1. Process community empowerment activities

The visual documentation shown in figure 1 indicates that the community empowerment process carried out by participants from the community was enthusiastic and had a high level of participation. Participation was not only evident in terms of enthusiasm, but also in terms of collaboration and solidarity among participants in making banana chips. (Kiss et al., 2022). In addition, participants also recognized that this program had a high impact on improving family welfare. This condition showed that the participatory approach used was able to encourage two-way interaction between facilitators and participants. Through this interaction, the learning process was not only one-way, but took place actively by involving the experiences and views of participants (Saputra et al., 2026). The mentoring activities and the resulting banana chip products are presented in Figure 2.



Figure 2. Products and assistance for community empowerment activities

The second image illustrates the empowerment mentoring process and its outcome banana chips as a tangible effort to foster local entrepreneurship within the community. It reflects how the mentoring activities are not limited to theoretical explanations but are implemented through practical guidance that allows participants to be directly involved in the production process. Through this approach, participants are able to understand each stage of the activity, starting from the preparation of raw materials, processing techniques, until the final product is ready to be distributed or marketed (Aji et al., 2025).

Furthermore, the image also demonstrates the close connection between the training activities and the resulting product. The mentoring process is carried out intensively and continuously so that participants can gradually improve their skills and confidence in producing banana chips as a local entrepreneurial product. This structured assistance ensures that the knowledge and skills delivered during the training can be effectively practiced by the participants in their daily activities (Yulistiani et al., 2025).

In addition, the mentoring process plays an important role in strengthening the spirit of community empowerment. By actively engaging in the production process, participants not only gain technical skills but also develop a sense of independence and responsibility in managing local resource potential (Sayyidina & Suminar, 2025). As a result, the production of banana chips becomes more than just a training outcome; it represents a sustainable effort to encourage economic independence and the growth of local entrepreneurship within the community.

The Impact of Community Empowerment Activities

After the entire series of community empowerment activities has been carried out, the next step is to conduct an evaluation to assess the impact of the program. This evaluation aims to identify changes in participants' behavior and responses following their participation in the various training and mentoring activities provided. The behavioral impact of the community empowerment activities was determined through the results of a questionnaire distributed to the SEPATAH KATA community as a post-program evaluation. The percentage from Figure 3 is as follows.

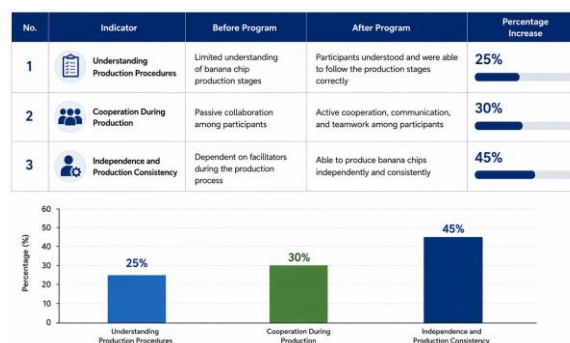


Figure 3. The impact of community empowerment activities

Based on the results of the evaluation conducted to identify the behavioral impacts experienced by participants in implementing community empowerment activities in the process of making banana chips, as shown in Figure 3, it can be seen that the community empowerment activities have different impacts on several aspects of participants' skills in the banana chip production process. Three main indicators were evaluated, namely accuracy in following the production steps, the ability to collaborate in the production process, and participants' independence and consistency in producing.

The evaluation results show that the indicators of participants' independence and consistency in production achieved the highest percentage at 45%. This indicates that the majority of participants have been able to produce banana chips independently and maintain consistency in the production process after participating in the training and mentoring activities (Alzate Acevedo et al., 2021). This achievement indicates that the empowerment program successfully enhanced participants' capacity, particularly in terms of entrepreneurial independence based on local potential (Otiniano León et al., 2025).

Meanwhile, the indicator of the ability to cooperate during the production process scored 30%. This result indicates that the participants were quite capable of cooperating and collaborating throughout the production process. This cooperation was evident in the division of tasks, communication among participants, and mutual assistance in completing each stage of the banana chip-making process (Santos et al., 2023). The indicator for accuracy in following production steps scored 25%, which was the lowest score compared to the other indicators. Nevertheless, these results still indicate that the participants have a basic understanding of the procedures for making banana chips (Laborde et al., 2025). However, further improvement is needed through more intensive guidance so that participants can follow each production step more accurately and consistently (de Lima Ferreira et al., 2024).

Overall, the evaluation results indicate that the community empowerment activities carried out have had a positive impact on improving participants' skills, cooperation, and self-reliance in developing a banana chip production business as part of efforts to strengthen local entrepreneurship. This finding demonstrates that the training and mentoring processes implemented in the program were able to provide meaningful learning experiences for the participants, particularly in enhancing their practical abilities in processing local resources into products with economic value (Candan et al., 2021).

CONCLUSION

The community empowerment program through banana chip production in Kalongan Village demonstrates that participatory training and mentoring activities effectively strengthened women's entrepreneurial capacity. Participants showed improvements in technical production skills, cooperation during production activities, and independence in developing local entrepreneurial activities. The highest improvement was found in participants' independence and production consistency, indicating that practical mentoring activities contributed positively to strengthening women's confidence and entrepreneurial participation. However, the program still faced several limitations, particularly related to the short training duration and the absence of market testing and business feasibility analysis. Therefore, sustainable follow-up programs are needed to strengthen the long-term impact of the empowerment activities. Several realistic and measurable follow-up actions are recommended, including: (1) digital marketing assistance through social media and marketplace platforms; (2) product packaging and branding development; (3) assistance in obtaining halal certification and PIRT permits; (4) product quality and shelf-life testing; and (5) strengthening women's entrepreneurial groups through continuous mentoring and institutional development. These follow-up activities are expected to support the sustainability and competitiveness of banana chip products as local entrepreneurial commodities in Kalongan Village.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

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