

BLENDING TRADITIONAL AND DIGITAL MEDIA: A COMPLEMENTARY EXTENSION APPROACH IN PROMOTING SUSTAINABLE GOAT PRODUCTION PRACTICES IN ILOCOS NORTE, PHILIPPINES

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ABSTRACT

This study highlights the knowledge uptake and attitudinal impacts of the school-on-the-air (SOA) program, complemented by a social media platform, in promoting appropriate goat production technologies among stakeholders in Ilocos Norte, Philippines. The program was conceptualized and implemented by the Mariano Marcos State University. Tailor-fit topics were delivered based on the felt needs of the enrollees. The SOA was broadcast on three local community radio stations strategically located within the province and livestreamed via Facebook. The SOA runs from June 2023 to February 2024. Traditional assessments revealed a positive impact of the platform on improving knowledge uptake of participants, as manifested by the high passing rate of participants in the quizzes administered. Significant differences were observed in pre- and post-test scores, which indicate that the enrollees performed significantly better on the post-test than on the pre-test, a manifestation of an effective platform of knowledge dissemination. Additionally, high graduation rates were recorded, and self-initiated requests for additional capacity-building activities highlighted the platform's impact in fostering interest, knowledge application, and continuous learning and self-improvement among the participants. This complementary extension modality demonstrates that radio, coupled with social media, is an effective approach in the diffusion of knowledge on improved goat production practices.

Keywords: social media, school-on-the-air, goat, improved practices

INTRODUCTION

Goat production is an integral component of the agricultural landscape of the Ilocos. This animal commodity is known for its adaptability to the climatic conditions of the region and perfectly fits the farming system, making it a valuable livestock resource for local farmers. The production of goats not only provides a sustainable source of meat for the community but also contributes to the economic livelihood of many households. Additionally, goat farming helps diversify agricultural activities, promotes sustainable land use, and supports rural development in the Ilocos and the province.

The region ranked second with 2.23 thousand metric tons of live weight production, while it ranked fourth in terms of goat inventory at 374.74 thousand heads (PSA, 2023). The province ranked third in terms of volume and inventory of goats among the provinces of the region. On the other hand, the Cooperative Development Authority of the Philippines

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identified goats as one of the livestock commodities of the province, while the Department of Trade and Industry identified goats as a niche commodity of the Ilocos, including the province.

The Mariano Marcos State University recognized the importance of this animal commodity in the province. Through the years, the extension arm of the university has implemented numerous extension activities and programs that promote technologies for improved production. Among these are the provision of training and seminars, dispersal of breeders, and production of information education campaign (IEC) materials. To reach more raisers, the university initiated the school-on-the-air program (SOA) locally dubbed “*Eskwela ti Tangatang*” as an extension tool in the delivery of goat-based technical know-how and technologies. The uniqueness of the SOA program at the university is its complementation with other communication support strategies, like social media, as the emerging platform of communication and distribution of IEC materials. This complementary extension medium of the university was realized in partnership with local radio stations in the province, reaching even the far-flung rural communities and offering convenient learning opportunities to smallholder raisers.

Radio has been used extensively as an educational medium in developing countries and as a source of information that creates widespread awareness in a certain community. Radio is considered the most accessible of all media, and most people can be reached at a relatively low cost. Thus, radio has a wide potential in educational delivery. Considering this, the SOA program aimed to increase the technical uptake of goat-based technical know-how and technologies among smallholder raisers in a fast, convenient, and cost-efficient learning mode. The study aimed to understand the dynamics of the school-on-the-air (SOA) program and social media as a complementary extension platform in the promotion of goat production technologies.

MATERIALS AND METHODS

Project Organization and Formality Setting

The SOA was spearheaded by the Applied Communication (APCO) Section of the Extension Directorate. Speakers or technical experts were the faculty of the Department of Agricultural Sciences- Animal Science Division of the university. On the other hand, to facilitate the recruitment of SOA enrollees, partner Municipal Agriculture Offices (MAO) identified SOA coordinators from the different municipalities. On the other hand, agreements were formalized among the stakeholders, and a Memorandum of Agreement (MOA) was signed between MMSU, the Local Government Units, Provincial Government of Ilocos Norte, and the radio stations involved.

Project Operation and Management

Active participation among the stakeholders was ensured. The LGU played a great part in the selection of community members as enrollees. An inception/planning meeting was conducted with the LGUs to validate and ensure the alignment of the topics with the immediate needs of the enrollees. All interested community members who wanted to enroll in the SOA were asked to fill out the enrollment form. The SOA coordinators facilitated the recruitment of farmer-enrollees from their municipalities, executed a pre-airing survey, and distributed and collected enrollment forms. The results of the pre-airing survey were

consolidated, specifically in identifying the topics that are important to the enrollees. This ensured horizontal alignment of topics to the needs of enrollees, as well as the selection of lecturers. The following topics were identified: feeding and nutrition, management during the rainy season, breeding, and marketing live goats.

The airing of recorded lectures with partner radio stations was done during lunchtime, from 12:00 noon to 1:00 PM. The preferred time slot was identified by the enrollees. The lecturers used PowerPoint presentations as the lectures were simultaneously broadcast via FB live. Pre and post-tests were administered at the start and end of the project. The answer sheets of the participants were personally collected by the SOA coordinator, checked, and the scores were recorded. Lectures were delivered using the vernacular language. Before the beginning of the lecture in subsequent airings, a question-and-answer portion was done, wherein the questions of the participants were collected by the SOA coordinators or via Fb messenger and answered by the lecturers. Quizzes were also administered. The SOA runs from June 2023 to February 2024, and all enrollees were encouraged to attend all the lecture airings.

At the end of the project implementation, a graduation program was held. Top achievers were recognized and given modest incentives. A post-implementation survey was conducted to determine the immediate impact of the project on the beneficiaries. Moreover, follow-up activities were made to enrollees to verify what information and technologies were tried and adopted, know what problems and needs they have in the adoption of activities, provide a continuous technical support system, link clients to and for assistance from other agencies, provide production materials, and other post-implementation services.

Descriptive statistics were used to analyze the socio-demographic profile of the respondents, and paired t-test analysis using SPSS v 20.0 was used to determine the significant impact of the SOA on the knowledge uptake of enrollees using the pre- and post-test scores.

RESULTS AND DISCUSSION

Targeted Local Reach and Lecture-Broadcast Dynamics

Lectures were aired on three local community radio stations in the province of Ilocos Norte. Community radio can play a significant role in disseminating information to rural illiterate and semi-literate farmers as it is affordable and accessible. It is a powerful communication tool that reaches the farmers in the absence of a regular and stable electric supply can run with a battery. It is also a portable medium that a farmer can carry with him/her to the place where they work and listen to the station while doing their work (Nirmala, 2018). The three radio stations are strategically located in different geographic corners of the province, which ensures a wider reach. The DWFB Radyo ng Bayan Laoag reached almost all towns of the Central to Southern part of the province. DWCI 105.1 Radyo FM, based in Piddig, I.N., reached the eastern towns, while DWNI Radyo Karruba situated in Burgos, I.N., catered to northern towns.

Furthermore, the program was also aired via Facebook Live to reach a greater audience and, at the same time, address the demand of some enrollees to join via the platform. Kabir *et al.* (2023) emphasized that the use of social media like Facebook in agricultural extension enables the connection, sharing of experiences, advice seeking, and access to valuable information among gardeners. Livestreaming was done via the DWFB Radyo ng

Bayan FB page, cross-posted in the MMSU Extension Directorate FB page, and sometimes shared by the MMSU Official FB page.

The program produced a total of 60 airings per station and 60 live broadcasts via FB lives of Radyo ng Bayan and MMSU Extension Directorate. An average of 80 percent attendance based on the total enrollees was recorded every airing. The bread and butter of these airings/broadcasts were tailored-fit topics that were formulated based on the felt needs of the enrollees. The topics presented were the specific components of successful goat raising, evolving on the three pillars: nutrition, breeding, and management. Specific topics were feeds and feeding management, disease and health management, breeding, reproduction and selection, goat housing, silage making, animal insurance and farm planning, budgeting, and record keeping. Interestingly, topics outside goat raising targeting the raisers themselves were also delivered, which include occupational safety and grit and resilience: a guide in facing life's challenges and adversities in livestock production.

Socio-Demographic of the Enrollees

The sociodemographic profile of the SOA participants is presented in Table 1.

Age and sex. The most represented age group was the older adult segment (46–60 years) at 27.58%, suggesting a mature demographic interested in continuous learning or improving agricultural practices and still in their most productive age. It also confirms the statistics that our farmers are already old. Young adults (18–35 years) comprised 17.05%, and middle-aged adults (36–45 years) followed closely at 16.77%. Seniors aged 61 and above made up 10.81%, and adolescents (10–17 years) were 1.32%. Notably, 12.61% did not report their age. This distribution reflects the intergenerational appeal of the SOA, with the majority being adults actively involved in livelihood and family support. On the other hand, more than half (56 %) of the respondents are male, while the remaining (44 %) are female. The higher proportion of male enrollees might be attributed to the time slot of airing of the program, which is at noon. Male farmers are usually resting at the identified time, which enables them to listen to the program. Rao (2015) asserted that certain time slots are better for farmers when they are home and have finished all other work.

Civil status. The civil status of respondents reveals that the majority (74.50%) were married, which may explain their high interest in livelihood-related programs, as they bear responsibility for household well-being. Single participants accounted for 20.51%, and widows or widowers made up 6.44%. This aligns with the demographic typically engaged in rural economic activities and responsive to educational interventions that support family livelihoods.

Educational attainment. Educational levels among participants varied, with college graduates representing the largest group (24.32%), followed by high school graduates (22.94%), and college undergraduates (9.91%). Senior high school graduates comprised 9.01%, while elementary graduates were 6.17%. Vocational or technical course completers made up 6.44%, while a small number had attained a master's degree (0.21%). A portion of the respondents did not report their educational background (10.19%). This diverse educational profile suggests the program is accessible and relevant to learners across educational levels, from those with formal training to those with limited academic background.

Table 1. Sex, age, civil status, and educational attainment of the school-on-the-air (SOA) program enrollees on goat production and management.

Demographics	Frequency	Percentage
Sex		
Male	820	56
Female	644	44
Age		
Adolescent Age (10-17)	19	1.32
Young Adult (18-35)	246	17.05
Middle-aged (36-45)	242	16.77
Older Adult (46-60)	398	27.58
Senior (61 and above)	156	10.81
N/A (did not answer)	182	12.61
Civil Status		
Married	1075	74.50
Single	296	20.51
Widow	93	6.44
Educational Attainment		
Master's Degree	3	0.21
College Grad	351	24.32
College Level	143	9.91
Technical Vocational	93	6.44
Senior High School Graduate	130	9.01
Highschool Grad	331	22.94
Highschool Level	88	6.10
Elementary Grad	89	6.17
Elem Level	17	1.18
N/A (did not answer)	147	10.19
Category/Occupation		
Agriculture Related (Livestock Raiser, Agricultural Technologist, and Agricultural Assistant)	1038	68.70
Household	322	21.31
Education (Teacher and OSY)	4	0.26
Government/Community Service Government Employee, BHW, and NGO)	82	5.43
Community Organization (4-H Club, Agri-Youth, and WID)	12	0.79
Other Labor & Employment (Driver, Working, DWC, and Souvenir Maker)	13	0.86
Unemployed (Student and Looking for a Job)	40	2.65

Category/occupation of participants. The majority of participants (68.70%) came from the agriculture-related sector, comprising farmers, livestock raisers, agricultural technologists, and extension workers, highlighting the program's core target audience. Household members accounted for 21.31%, which may indicate indirect engagement with agricultural activities or support roles in family-based farming. A smaller segment came from government and community service (5.43%), followed by participants in education, labor, youth organizations, and other employment sectors. This shows the program's reach beyond just farmers, encompassing other community members with a stake in agricultural development.

Times of enrollment in SOA. A large portion of respondents, 76.72% (1,107 individuals), were first-time enrollees in the SOA program (Table 2). This shows the continued reach of the program in attracting new participants, especially those seeking accessible learning platforms in agriculture. Meanwhile, 10.12% (146 individuals) had enrolled once, 9.70% (140 individuals) twice, and 3.47% (50 individuals) three times. The presence of repeat enrollees suggests that previous participants found the program beneficial, motivating them to re-enroll.

Table 2. Times of enrollment and reason for enrolling among the School-on-the-Air (SOA) program enrollees on goat production and management.

Times of Enrollment to SOA	Frequency	Percentage
First Time	1107	76.72
Once	146	10.12
Twice	140	9.70
Thrice	50	3.47
Reason for Enrolling in SOA (multiple responses)		
To gain knowledge and learn new things	513	35.55
To improve farming and livestock practices	177	12.27
To apply knowledge to livelihood and daily life	68	4.71
To improve agricultural/livestock productivity and management	69	4.78
To ensure proper livestock care and management	64	4.44
To learn modern technology and innovations in farming	67	4.64
To become responsible and skilled in animal farming	46	3.19
To have better opportunities for income and livelihood	3	0.21
To learn about government programs and access support	9	0.62
To have access to education and information	3	0.21

Reasons for enrolling in SOA. The top reason was “to gain knowledge and learn new things,” selected by 35.55% of respondents (Table 2). This was followed by the desire to improve farming and livestock practices (12.27%), apply knowledge to livelihood and everyday life (4.71%), and enhance agricultural/livestock productivity and management (4.78%). Other motivations included acquiring modern farming technologies, accessing

information about government programs, and engaging with useful content during their free time. This range of responses illustrates that the SOA program fulfills both intellectual and practical needs, particularly in rural agricultural communities.

Knowledge Uptake Indicators Through Traditional Assessments

Knowledge assessments were administered, particularly quizzes and pre- and post-tests (Figure 1). The pre-test was administered to gauge the knowledge level of enrollees on goat production before engaging in SOA. More than half (52%) passed, and 48 % failed. This indicates that the majority of the enrollees have previous or basic knowledge of goat production management. This is attributed to the exposure of the participants to many extension services offered within the province regarding goat production.

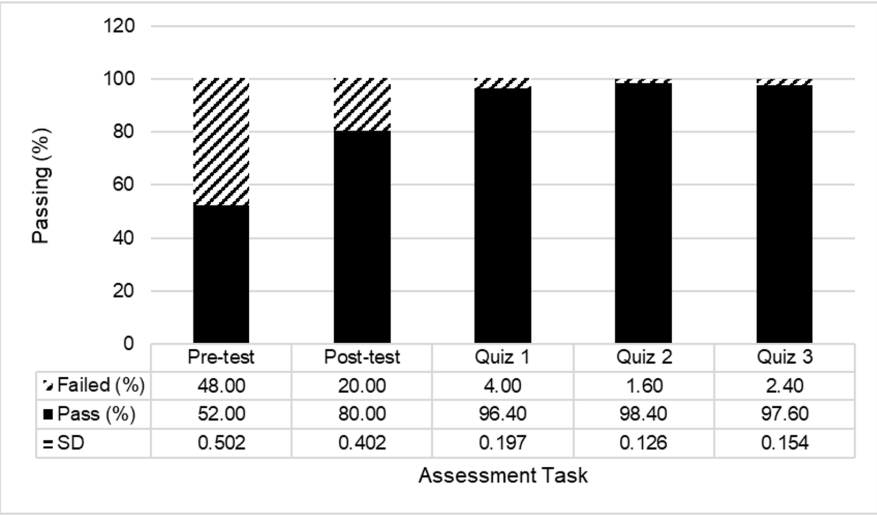


Figure 1. The passing percentage of School-on-the-Air (SOA) program enrollees on the implemented assessment tasks (passing score: 50%).

On the results of the post-test administered, a significant increase was recorded in the percentage of enrollees with a passing score from 52% during the pretest 80% passed the post-test, an increase of around 28% among the participants. This implies the effectiveness of the SOA as a tool in increasing knowledge uptake of enrollees.

On the same trend, of the three quizzes administered during the implementation of the SOA, a high passing percentage among enrollees was recorded. It can also be noted that the standard deviation of the quizzes (0.197, 0.126, and 0.154) was low, which means that most of the enrollees scored close to the average, indicating consistency in performance. The complementation of live radio airings and FB livestreaming positively influences the knowledge retention of farmers using quizzes as an assessment tool and their consistent performance. This is because enrollees with FB accounts can easily revisit the recordings on the FB pages when they fail to understand the live lectures, ensuring a complete grasp of the topics.

Based on the result of the paired sample t-test (Table 3), there was a statistically significant difference between the pre-test (M_1) and post-test (M_2) scores, $t(124) = 7.95, p <$

.001. These results indicate that the enrollees performed significantly better on the post-test than on the pre-test. This insinuates that SOA, complemented with FB livestreaming as a method of teaching farmers, had a real effect on their knowledge uptake on goat production and management despite varying educational backgrounds, listening environment, attendance and participation, and motivation and interests of the enrollees. Moreover, the use of vernacular in lecture delivery might also contribute to the effectiveness of the complementary radio airings and FB livestreaming, which is aligned with the statement of Rao (2015) that radio programs in vernacular languages provide new communication channels and space for dialogue for communities in more remote areas, or of varying literacy levels. The observation is in congruence with the findings of Silvestri *et al.* (2021) that interactive radio and social networking sites improve knowledge among farmers and allow the dissemination of information on innovative agricultural techniques, which supports the adoption of legume-based sustainable practices. Similarly, with the assertions of Shodipe *et al.* (2024) that radio is effective in influencing the practices of farmers and helping them adopt new knowledge, ideas, and skills.

Table 3. Paired samples T-Test of the pre- and post-test of the School-on-the-Air -Air (SOA) program enrollees on goat production and management.

			statistic	df	p
POST-TEST	PRE-TEST	enrollees t	7.91	124	<.001

Note. $H_a \mu_{\text{Measure 1 - Measure 2}} \neq 0$

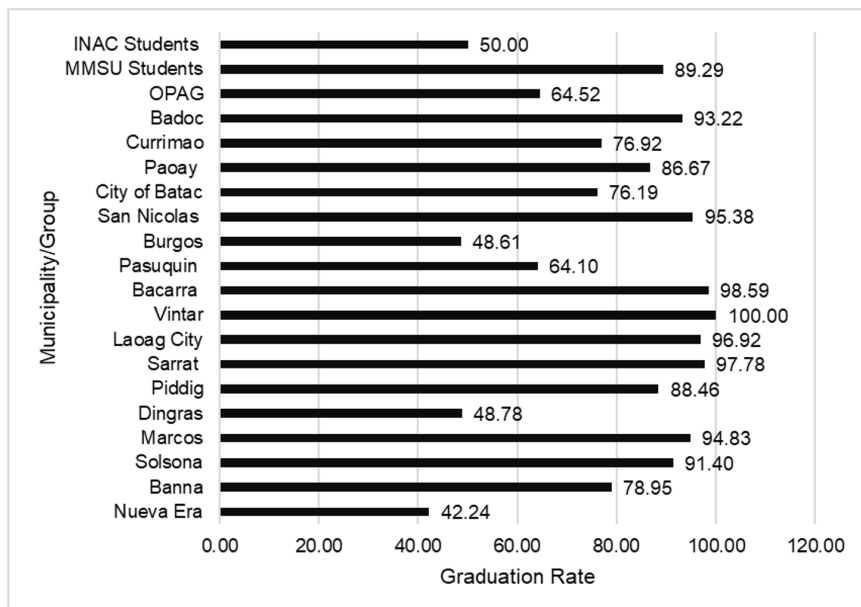


Figure 2. Graduation rates of School-on-the-Air (SOA) program enrollees in goat production and management, with a mean of 79.14 % (Total Enrollees: 1623; Total Graduates: 1300; Graduation Rate: 80 %).

Graduation Rates of Enrollees

The mean graduation rate of farmer enrollees across groups or municipalities is 79.14 percent, which is more than a quarter of the officially enrolled participants (Figure 2). The graduation rate is relatively high despite the long duration of the SOA. This reflects sustained interest and trust in the program by the enrollees and indicates that it holds their attention over time. Moreover, it suggests strong engagement and relevance of the SOA to the enrollees' needs. It also implies that enrollees acquired or improved a basic understanding of goat production management, which is considered an alternative for successful knowledge dissemination. On the other hand, the complementation of SOA and social media livestreaming is a manifestation of integration and synergy as reflected by the high graduation rates of enrollees. It shows not only the effectiveness of the radio delivery system but also the added value of social media in enhancing the understanding, retention, and interest of participants. Moreover, social media facilitates two-way communication that promotes interactivity, which positively influences motivation, that influences program completion among enrollees.

More than 300 enrollees were considered dropouts of the program. Among the recorded reasons for the non-continuity of participation are migration to other countries and outside the province; some were heavily affected by strong typhoons, lack of time to participate, and were loaded with many activities.

Visibility of the Program via Facebook

The complementation of social media to the SOA program opens a wider communication not only to the enrollees but also to the communities. As a result, it created more opportunities and partnerships with various stakeholders. Data showed that simultaneous live streaming of the lectures garnered 1.5 million views, 9,280 comments, 6,146 hearts, and 1,664 shares. These huge engagements with the livestreaming imply the effectiveness of the program in catching the attention of social media enthusiasts of various backgrounds. Sandeep *et al.* (2022) claim that social media platforms can be utilized effectively by developing a better interface and information content. Similarly, Munthali *et al.* (2021) elucidated that the platform plays meaningful roles in supporting knowledge processes and is likely to generate useful input for knowledge integration and collaborative problem solving in complementary face-to-face settings.

Self-Initiated Requests of the Enrollees

The project recorded self-initiated requests among the enrollees as presented in Table 4. Identifying the self-initiated requests of the enrollees is a good indicator of the use of SOA and social media complementation in knowledge and information dissemination. These voluntary actions of the enrollees insinuate that the participants are not merely passive listeners, but they are also motivated, engaged, and with a high degree of eagerness to elevate beyond the basic content provided by the program. Moreover, their interest in seeking further learning opportunities beyond the platform reflects engaging interests, relevance, and trust in the SOA program.

Among the requests recorded by the program include the provision of planting materials of improved forage species and hands-on training on feeding management, silage making, and improved forage pasture production. Furthermore, information and education materials were also requested and provided to the enrollees. These self-initiated requests of

the participants were rolled out after their graduation. This behavior among the enrollees ignited curiosity and the desire to apply the knowledge they gained via the platform, enabling them to pursue more hands-on capacity-building activities, which is a clear sign of effective knowledge transfer. Likewise, the program promotes continuous learning and self-improvement among the enrollees.

Table 4. Self-initiated requests of the School-on-the-Air (SOA) program enrollees on goat production and management.

Type	Nature of Request	Nature of Assistance Provided
Messages in the FB Page/Messenger Account/Group	Copies of IEC materials to be provided after the program	Links to the topics (in videos) were provided to the participants after the SOA Topics are transcribed and posted on the FB page after each lecture Press releases were published in <i>Bannawag</i> for wider coverage and dissemination IEC materials were developed, reproduced, and distributed during the SOA graduation
Conduct of Training	Face-to-face training and conduct of an actual demonstration on silage making	Three batches of training were conducted in various locations, attended by SOA graduates (155 participants attended). Forages/Planting materials were distributed to the participants Hands-on training was conducted on silage and concentrate making
Consultancy Services	Face-to-face/SMS	Community members come to the University for advice Community residents are sending messages via SMS/Messenger and asking for assistance with feeding management and problems that arise

CONCLUSION AND RECOMMENDATIONS

The study underpins the vital role of the school-on-the-air (SOA) program, complemented with the use of social media, in the promotion of improved goat production practices. The high graduation rates of enrollees and substantial knowledge gained, reflected in the pre- and post-tests, demonstrate the effectiveness of this extension platform. The program's success is also reflected in the active engagement of the enrollees and self-initiated requests in support of the foundation knowledge they gained, which communicates an intensifying commitment to improving their production practices and manifestation of

continuous learning and self-improvement.

This complementation of traditional radio and digital platforms proved to be an effective tool in disseminating agricultural knowledge as well as igniting interest and engagement of stakeholders. As such, effectiveness is directly connected to the alignment of its content with the specific needs of the participants, enabling relevance and practical application in their farming activities. The results of the project suggest that complementary extension strategies like SOA, coupled with social media, can be a powerful platform in advancing agricultural innovation and improving practices of small-hold goat keepers. Since the use of radio combined with online platforms such as Facebook, as well distribution of IEC materials as supplementary reading materials, coupled with sustained monitoring, a combination of traditional and contemporary media can be used to improve the knowledge of the farmers. The sustained partnership with the local government units that are in the grassroots and have primary contact with the farmers in the community are important intangible characteristic to have sustainable development programs or projects.

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