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Local Textiles Development to The Royal Peacock Certification Quality Thai Silk in Kalasin Province

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Abstract

'Local Textiles Development to The Royal Peacock Certification (RPC) Quality Thai Silk in Kalasin Province' is public-service, academic article of which presenting Kalasin local textiles elevating process in community-based producer and entrepreneur groups regarding to The Royal Peacock logo and standard certification by Participatory Action Research (PAR). The target population was 20 groups of producer and entrepreneur in Kalasin Province participated in textiles product analysis, workshop training series in The Royal Peacock Certification (RPC) standard requirements, prototype production for RPC standard, standard certifying process, and trends and benefit from standardization. The findings included the success in the silk and cotton textiles of the producer and entrepreneur group for The Royal Peacock Certification standard as well with the elevating training process on knowledge, green technology and skills in natural dyeing and primary fiber inspection leading to more of certified silk products. The product results in standardization by authorized officials of The Queen Sirikit Department of Sericulture came from all the 20 groups (100%) and more in the groups have been producing to be certified with the trend in producing certified local textiles to a greater extent income increasing in community-based, silk product entrepreneurs.

Keywords: Local textiles, Product standard, Kalasin province, Thai silk

Introduction

Kalasin located in the middle of Northeastern Thailand, 519 kilometers from the capital of Thailand, Bangkok, with 6,946.75 sq. m. or 688,000 hectares in size. The huge, complex mountains called Phuphan with flat valley and thick woods among them have Pao and Phan river in which Kalasin settlers live on that low flat land along the rivers for multiple agricultural activities. The rainy season gave rain approximately 1,463.2 mm/year for most of working age in total population of 986,000. Its' economic overall picture showed in 53,069 million Baht by Gross Provincial Product

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(GPP). Kalasin farmland produced rice, cassava, sugarcane and rubber and this sector was 24.2% of GPP. In the year 2016, Kalasin income per head was 57,798 Baht/year as it was recessive during the year 2013 to 2015, fallen to the 71st. province of the country, and when compared with the center of Northeastern provinces, Kalasin was the last in the list. (Kalasin Provincial Office, 2020) Kalasin became an income inequality concern and has been officially planned to improve grassroot economy particularly in the GPP per capita.

In Kalasin low level GPP per capita, Kalasin is wealthy in cultural resources. The cultural capital is remarkable and contain high potential to elevate in the firm and unique base cultural and artistic textile by the situation before changes in the area.

1. In values, extraordinary and prominent status of Kalasin textiles: Kalasin is full of ethnics' diversity and their local-textile weavings are lavish identities. Kalasin's Praewa as a hand woven, artistic, standout silk textile belongs to Phu Tai wisdom as well registered as GI product titled 'Kalasin Praewa Silk' textile specifically in these districts; Kham Muang, Sahatsakant, Somdej and Sam Chai. It is inherited in families and in their communities in aesthetic PhuTai arts and crafts with unique motif. Kalasin Praewa is high in artistic quality and price and in its reputation for extraordinary silk incomparable to other source of Praewa. Department of Intellectual Property, Ministry of Commerce registered Praewa as GI product on 24 October 2007 entitled "Kalasin Praewa Silk" by No. Sor Chor 50100021 plus all the privilege of GI product for the no-time-limit protection. However, the GI product Praewa faced heavily marketing challenges by technical issues like colors qualities and non-standard silk fiber.

2. Economic Status: in the year 2014, Praewa commercial value record made to 102.51 million Baht, increased to 115.95 million Baht in the year 2015 and the latest record in the year 2018 reached 314.08 million Baht. The growth from 2014-2018 increased 211.57 million Baht or 206.39% (51.60% a year). In part of Office of Provincial Development, by its' local textiles promotion and support plan that aimed to boost family income by Strategy 2; designated to 'Elevating local wisdom product with innovation to standard and competitiveness' to increasing Praewa sale indicator. The challenges of the strategy were the sale of OTOP (One Tambon-subdistrict, One Product-Thai government's local entrepreneurship promotion program) based on higher cost of silk fiber and in products causing higher product price and no proactive market strategy, no partner, and no attractive design for Praewa. Product and marketing development have faced no tourist and no tourist attractions links and inaccessibility by market networks. Hence, it has been planned to emphasize in administration and management to improve Praewa standard, promote community-based enterprises, increase Praewa silk and products market channels, promote new product designs, improve quality of the product to meet the market demands, reducing production cost from production of sericulture in all steps and building investment networks and partners.

In studies and authority designation on The Royal Peacock Certification (RPC) standard determined by The Queen Sirikit Department of Sericulture (QSDS) classifies The Royal Peacock Certification standard in 4 classes as following.

Royal Thai Silk of Gold Peacock trademark class is native, local breed, and original silk worms rearing for both the warp and the weft yarn, hand-spun by simple homemade tools and gears. The local and original sericulture from the beginning to have silk yarn for hand weaving process, from hand spooling and spinning to wooden, bobbin loom weaving eco-friendly, natural dyeing yarn process included natural mordants. All part of the product must be made in Thailand.

Classic Thai Silk of Silver Peacock trademark class silk is silk products made from native silk worm or hybrid silk worm developed in Thailand for the warp or the weft yarn. The silk textile must be hand-spun and woven by a wooden hand-loom, classic methods or applied tools or gears in some steps of the entire process such as low power motor-driven spooling, woven by hand shuttle or common loom but must be all Thai product.

Thai Silk of Blue Peacock class is pure or hybrid silk worm breed in sericulture and its product. The products that used foreign silk yarns must be clearly identified on the products label. The silk textile produced on Thai local mixed with hi-tech and modern process for commercial and market demands with warp and weft genuine silk yarns in natural dyeing or eco-friendly chemical dyeing process, by any types of looms woven but only Thai product.

Thai Silk Blend or the Green Peacock class is native silk worms as a main source of materials with other fabrics as additional components. This class of silk textile produced in modern technology integrated Thai local pattern and colors woven mixed with genuine silk thread with natural or synthetic fibers for the market demands, woven by any type of loom, eco-friendly natural or chemical dyeing. All must be Thai product. (The Queen Sirikit Department of Sericulture (QSDS), Regional Office Zone5, Chumphorn Province, online)

Suphannee Phornphakdi and others (2016) studied consumers' perception toward RPC silk textile in Nakhonrachasima Province to understand consumers' perception, relation between market communication and consumers' perception, and consequences of perception on quality standard trademarks of RCP silk products. The study found consumers decided to buy RPC silk products as souvenir and gifts for special occasions and the decision making were quality of textile, pattern/ motif, and textile colors. Most of the consumers bought the products in products exhibition. The popular products were fabric, scarf, necktie, cushions, coin purse, and handbag, and in the same reasons for ready-to-wear garments. Popular colors tones of the silk products were brown, gold, blue, yellow, and orange respectively. The sources of information for decision making were person to person recommendation, exhibition and fair, internet including to online shopping. For a piece of plain fabric or textile, the quantity needed mostly was about 4-5 yards long and the price was between 1,000 – 1,500 Thai Baht for the silk fabric.

In relation between market communication and consumers' perception in RPC silk textile found on the same direction of perception and market communication meaning the more market communication made, the perception increased. In bringing in research results to the producers and entrepreneurs' locations and to the community enterprise managing members, it was aimed to provide knowledge and information in marketing communication to have value-add and create attractive sign/tag and inviting e-public relation. The product presentation has been made progress by sale person and public relation via press/ mass media channels to increase buyers' perception in Nakhonrachasima RPC silk products.

In the year 2018, The Department of Science Services (DSS) by Ministry of Higher Education, Sciences, Research, and Innovation (MHESRI) implemented OTOP product up-level in the 10 poorest provinces and Kalasin as one of them were selected by working with two OTOP groups; nonmedicinal herbs and the most important OTOP products of the province. In local textile entrepreneurs and producers, it was planned to adapt and develop to Quadrant D[1] for 95 groups and for DSS evaluation as a funding agency.

In part of KSU for the success of the province's OTOP elevating project in the year 2019, DSS signed contract agreement on consulting services by the 7/2562 agreement document. It was planned in the up-level via standard to make changes in value and price. KSU recommended to elevate local textile especially the one that is Kalasin domestic and international reputation, symbol and famous for producing it to RPC[2] standard. KSU academic and technical services have been providing by eliminating the issues in the local textile quality like colorfastness, uneven color, and quality control of silk yarn. In part of price, RPC managed to guarantee the high standard that consumers perceived to have higher sale volume and higher-grade product.

Research Objectives

The article intended to present elevating process of local silk textiles in community-based silk enterprises in Kalasin to obtain RPC standard via Participatory Action Research (PAR). The PAR of which comprised of these activities; In-depth technical consulting, knowledge, technology, and innovation transferring, prototype textile producing for RPC standard, The Royal Peacock certifying and inspection processing, and future development of textile including design and monitoring in the local site.

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1 Community Development Department, Ministry of Interior strategically grouped product development by classify products into 4 classes; A group-international star, high end quality, high price and high productivity, B group-preserved value for niche customer, high quality, limited production, C group-developed to competitive market, good quality, market price and mass production and D group-adaptable to supply chain as mass market quality, mass price, low mass production

2 The Royal Peacock Logo as Certification trademark of Thai silk standard is designated to certify by The Queen Sirikit Institute of Sericulture which is now The Queen Sirikit Department of Sericulture (QSDS) in honoring and servicing HM the Queen's idea for more than half century royal sericulture promotion projects, all over the country, by the local silk production standardization in 4 classes; Gold, Silver, Blue and Green, respectively.

Research Methods

The PAR research article which the methodology employed in the PAR was designed base on participation, being acceptable by target groups and all participants as well as the changes making process.

1. Target groups in participation and acceptance

Kalasin local textiles development to reach RPC standard, the target groups, participation, and acceptance of the groups were followed in the criteria and process.

They were 20 groups of community base entrepreneurs and producers on criteria in Kalasin Province and participated in OTOP up-level project producing local textiles in the program services providing by DSS as in the department's economic statistic. The PAR started with these local entrepreneurs' willingness in participation to have mutual understanding that they demanded the RPC standardization and open for innovation consulting. Both the PAR team and target participants made co-decision to enter in the PAR process.

The target groups as knowledge provider or expert were DSS officials processed quality monitoring according to the QSDS standard codes. Independent assessment and results were open, informed, acknowledged, accessed, participated, and made to the 20 target entrepreneurs group involved in this PAR to be ready for their further commitment to have product improvement.

The PAR as well included the KSU faculties as target group for their duties and responsibilities in the PAR's design, administration, and management.

2. Research Scope: Kalasin local textiles development for RPC standard was scoped in these following scopes.

2.1 Time Scope; from 9 January 2019 to 29 March 2019 according to the No. 7/2562 Consulting Contract Agreement between Department of Science Service (DSS) and Kalasin University (KSU)

2.2 Spatial Scope was Kalasin Province

2.3 Content and changes process by defining activities involved in Kalasin local textiles weaving for RPC standard by these 5 groups of activities in series and involvement; In-depth, technical consulting, Knowledge, technology, and innovation transferring, Prototype textile producing to be certified as The Royal Peacock Standard product, Inspecting process to certify RPC standard, and Future Kalasin local textile developing and implementation concluding.

In which the research processing in PAR designed for changes as following:

2.3.1 Target groups selection criteria incepted at the 95 groups list of OTOP entrepreneurs in the top ten poorest provinces in Thailand by DSS and in scope of the PAR, 20 groups who were asked their willingness to standardize their products were selected for the participative workshops process.

2.3.2 In-depth, technical consultation not limit to target groups but the chairperson, committee members and groups members employed structure interview guidelines in focus group process.

2.3.3 In knowledge, technology, and innovation transfer through PAR workshops in 3 designed programs; Program 1. OTOP standard product up-level, Program 2. RPC standard and primary inspecting, and Program 3. Natural dyes and mordants and fiber preparation with 5 Likert rating scale. (Wade M Vagias, 2006)

2.3.4 Prototype textile for RPC standard by employing structural interview guideline.

2.3.5 Inspecting and certifying RPC by QSDS officials, the research team and groups' members employed structural interview guideline.

2.3.6 Monitoring and evaluation of DSS as the PAR funding agency to recommend future textile development by the DSS officials, the research team and groups' members employed structural interview guideline.

Research Results

The PAR on Kalasin local textiles quality for RPC standard designed the content scope in these 5 series of activities; intensive consultation, knowledge, technology and innovation transfer, RPC prototype textile products, the products inspecting for RPC by authority and evaluation, and textile future development. Knowledge and expertise motivated changes and resulting in research positive and progressive outcome. These activities in 5 series were implemented.

1. In-depth, technical consultation

The research team implemented target groups selection by utilizing the OTOP entrepreneurs' criteria in the 10 poorest provinces according to national statistic all of which participated in local textiles development project and selected from 95 groups in DSS list to have 20 selected groups. The team inquired their willingness to participate in PAR and in final selection step found local textiles entrepreneurs in 12 districts. Selected Entrepreneur groups in these 3 districts had the highest numbers of groups; 4 groups in Khammuang Districts, 3 groups in Somdej District and 3 groups in Sahatsakant District.

According to consulting contract agreement dated 7/2562 between Department of Science Service (DSS) and Kalasin University (KSU), the consultant team, in this article called, the research team designated and academical configurated in-depth, technical consultation to selected target groups by working with the groups' leaders; chairpersons, committee members and group members employed structural interview guidelines and Focus Group process. The research team found local textiles producers and entrepreneurs had limitation and constraints in these following issues.

1. Kalasin local textiles entrepreneurs did not have right perception in standardization, in criteria and types of the standard product, in all types of standard and in RPC standard and had no accessibility to verify and certify the standard, and the groups who wanted to standardize their products had no product in a greater extent of development to up level or increasing more of their standard products.

2. Insufficiency of effective coordination and less information from relevant supporting agencies for standardization, Kalasin textiles producers and entrepreneurs unable to access to the standardization they needed in all levels; subdistrict, district, provincial and services agencies. They were not able to plan for the certification process or inspecting process for standard submission.

3. Kalasin local textiles entrepreneurs produced both chemical and natural dyes weaving with less diversity of colors and shades. In case of chemical dyes, they used instance dyes packets with no variety of mixing that lower chances to create new colors and shades diversity. It was the same when they prepared weaving in natural hot dyeing, besides in case of create more of shades, many of OTOP groups have knowledge and know-how technic in making more shades with mordants but it was not popular to do so (that) causing as insufficient fibers bath and uneven hue on fibers then substandard to the end fabric product.

From the inception of PAR, programs for workshops were designed to comprehensively solve specific limitation and appropriate resolution for each problem of the entrepreneurs.

2. Knowledge, technology, and innovation transferring

In the consultation, intensively and comprehensively for the in-depth understanding, with target groups, the research team designed 3 learning workshop programs to match the target groups' need and demands.

Program 1. Qualified OTOP to reach standard quality to provide participants broader view and understand market and consumers' demands for OTOP standard market by lecture with audio-visual presentation about textile standardization.

Program 2. RPC standard and primary inspecting to envision participants in standardization, criteria, steps and inspection employed lecture and audio-visual for how to RPC certified.

Program 3. Natural dyeing and fiber preparation intensive and comprehensive workshop to enable the participants to use natural dyeing with proper and diverse mordants and have standard dyeing in RPC.

In the innovation transfer process, each program applied some of these steps as needed; awareness, interest, trial, adoption, and evaluation. In the 3 programs' activities, innovation acceptation steps focusing on awareness, interest, and trail. Adoption and evaluation will be in the next program activities.

Image 01 Knowledge, technology, and innovation transferring workshops

From the program activities, 70 participants of Kalasin local textiles producers and entrepreneurs in the completion of the workshop programs, it was found the satisfaction level, in average, was 4.36 with 0.8 standard deviation. It meant the satisfaction level was very high. It was, as well, meant the transferring activities were in very high level of awareness and perception and their issues and the resolutions were accepted. The participants, who have been transferred new things as innovation, were interested in it when they tested it by doing it in the workshop. Kalasin producers and entrepreneur designed products to be certified RPC standard in standardization requirements.

4. RPC prototype product

The set of these activities was to produce RPC prototype product by Kalasin local textiles producers and entrepreneurs as the workshop participants. They designed the products which would be standardized by RPC and classified the products in these following classes.

Table 1 Pattern and standard of RPC produced as prototype textiles

Product	No. Group	%
Mud Mee Silk	8	40
Praewa Silk	5	25
Scarf and shawl	6	30
Plain Silk	1	5
RPC	**No. Group**	**%**
RPC: Gold Peacock	3	15
RPC: Silver Peacock	0	0
RPC: Blue Peacock	17	85
RPC: Green Peacock	0	0

In the consulting process for RPC prototype products, the research team implemented in several stages; field works, person-to-person meeting, phone call interviews with structural guidelines enable the community entrepreneurs to plan their production plan and applied the new knowledge and technics as innovations in their real practices. RPC logo products for standard were successful in 2 classes; 17 groups of Blue RPC standard and 3 groups of Gold RPC standard

5. Inspecting process for RPC standard

This is the co-working of The Queen Sirikit Department of Sericulture (QSDS), the research team (KSU)and groups' members employed structural interview guidelines of which is the final step of innovation transferring as the evaluation. Results of RPC standard inspecting by authorized official from QSDS in classified standard criteria by which these products elevated to the next market level.

Table 2 Certified Groups of RPC in the PAR

Group	Group Title	Product	Classified Standard	Inspection Result	
				Certified	None certified
1	Cotton and silk Weaving Tai Don Jan group, Don Jan District	Mud Mee Local Skirt	Royal Thai Silk Gold Peacock	✓	
2	Silk Weaving, Mud Mee Local Skirt group, Na Mon District	Mud Mee Local Skirt	Thai Silk Blue Peacock	✓	
3	Mud Mee Silk Ban Non Chad group, Somdej District.	Mud Mee Local Skirt	Thai Silk Blue Peacock	✓	
4	Sammachep Ban Khok Klang textile group, Somdej District	Mud Mee Local Skirt	Thai Silk Blue Peacock	✓	
5	Mud Mee silk textile Srang Kaew group, Somdej District	Mud Mee Local Skirt	Thai Silk Blue Peacock	✓	
6	Praewa Ban Kae Nariang group, Sahatsakant District	Praewa Silk textile	Thai Silk Blue Peacock	✓	
7	Ban Nabon Textile weaving group, Muang District	Mud Mee Local Skirt	Thai Silk Blue Peacock	✓	
8	Ban Nong Song Maew Women Occupation group, Kham Muang District	Silk Scarf	Thai Silk Blue Peacock	✓	
9	Mud Mee Local Skirt Weaving Group Tha Khantho District	Silk Scarf	Thai Silk Blue Peacock	✓	
10	Ban Nong Kaensai Women Weaving group, Samchai District	Praewa Silk textile	Thai Silk Blue Peacock	✓	
11	Praewa Local Shawl Weaving group, Kuchinarai District	Praewa Silk textile	Thai Silk Blue Peacock	✓	

Table 2 Certified Groups of RPC in the PAR (cont.)

Group	Group Title	Product	Classified Standard	Inspection Result	
				Certified	None certified
12	Mudmee Silk waeving group , Nong Kungsri District	Shawl	Royal Thai Silk Gold Peacock	✓	
13	SiTakraw and Loincloth weaving group, Khao Wong District	Shawl	Thai Silk Blue Peacock	✓	
14	Local textiles Khid Dinosaur Weaving group, Sahatsakant District	Praewa Silk textile	Thai Silk Blue Peacock	✓	
15	Cotton Textile Ban Sa Weaving, Yangtalad District	Plain textile	Thai Silk Blue Peacock	✓	
16	Local textiles and Garment Making group, KhamMuang District	Shawl	Thai Silk Blue Peacock	✓	
17	Ban Nongkungklang women weaving group, Samchai District	Praewa Silk textile	Thai Silk Blue Peacock	✓	
18	Cotton and Mudmee weaving group Kammalasai District	Mud Mee Local Skirt	Thai Silk Blue Peacock	✓	
19	Na Makheu New Theory Agriculture group, Sahasakant District	Mud Mee Local Skirt	Thai Silk Blue Peacock	✓	
20	Hand-made garment BanKawdue M.7 group, Khammuang District	Shawl	Royal Thai Silk Gold Peacock	✓	

Evaluation and results from inspecting by QSDS officials according to the standard criteria of product classes in the 20 groups of participants (100%) by which 3 groups success for Gold RPC and 17 groups as Blue RPC.

Image 02-03 Inspecting for RPC standard

6. Evaluation of the PAR and program implementation

Activities to conclude DSS implementation as the PAR funding agency and the research team as the project consultant, implementors, facilitator, planner and technical and academic supporter and the entrepreneurs and producers to review the results of PAR and to recommend local textiles future development. The following outputs could be summarized in short.

Image 04 Department of Science Service (DSS) monitored and evaluated PAR

Image 05 Community products that have received standard certification

During 20-22 March 2019, DSS coordinated in one monitor and evaluation in the PAR sites to elevate the selected OTOP products to upgrade to higher standard and to develop the outstanding star products in the selected 10 groups. It was found 4.08 and in 0.4 standard deviation for the satisfaction level in the participants toward the PAR and in-depth technical consulting of which meaning the participants were very much satisfied particularly in the part on-site consulting that enable them to develop their products to target standard and meet the classy products in RPC and encourage them to increased RPC products in their enterprises.

Conclusion and Discussion

In the PAR to Develop Kalasin Province Local Textiles to reach RPC Quality Thai silk that was monitored and evaluated the changes, has been concluded to maintain and/or to extend the effects or to develop for benefits as following.

1. Conclusion and Discussion

Research team implemented local textiles quality elevating in the 20-group enterprises in these 5 designed activities; In-depth, technical consulting, knowledge, technology, and innovation transferring, prototype textile producing for RPC, textiles inspecting for RPC and implementation concluding with future textiles developing. The changing resulting in the PAR could be concluded as following.

In-depth, technical consultation: most of the groups were not certified by RPC standard because the insufficient knowledge and information about standard requirements and no technical know how about local textiles producing, meanwhile they wanted to produce RPC standard textiles.

Knowledge, technology, and innovation transferring were designed in a series of 3 programs; Program 1: OTOP standard to elevate to quality market, Program 2: RPC standard and primary quality requirement inspecting, and Program 3: Natural dyeing and fiber preparation. These programs designed in steps of learning; awareness, interest, trial, adoption, and evaluation. Groups' members in this transferring process were 70 and were evaluated the innovation transferring of the PAR researcher team which was found in very good level (4.36).

Local textile prototype for certifying to RPC standard; by which each group designed local textiles producing in accordance with the peacock classified standards; 3 groups in the gold peacock class, 17 groups in blue peacock class. In this program it was, in the closing, found RPC standard was met by all 20 groups (100%).

PAR implementation evaluation and future trend in local textile development: participants evaluated the program as in the very good satisfactory level at 4.08, particularly accessibility at the producers' local premises enable to provide consultation in all details to be capable to develop textile quality to obtain standard as required and more of the textile products were promising products to continually developed to obtain the standard.

Most of the community base enterprises obtained no standard products of RPC as insufficiency of information about the standard requirements and technical know-how to produce local textile to be consistently met with consumers' local textile demands. In accordance with the study by Suphaphorn and Sathaphorn Mongkholsrisawat, (2017) that the famous Praewa Silk textile of Ban Phon Subdistrict in Kham Muang District, Kalasin unable to develop to have product diversity to meet the mass market. The producers and entrepreneurs used to hold back or wait for supports or assistance from authorities and that made them have less to none information and

could not have new knowledge researching and creating new, attractive designs to diverse products. Kasiphat Thongkam and Kosit Phaengsroi (2019) studied Problems Solving Trends and OTOP Development Plan complying Buddhist Principle to Promote and Develop Community-based Enterprises in Udonthani Province implemented standardization in production steps and process, and quality control to become one higher standard and/or create product in distinctive identity.

Transferring of knowledge and information, technology, and innovation through innovative process in each set of programs were based on 5 of building steps; Awareness, Interest, Trail, Adoption and Evaluation. The evaluation at the completion of the PAR found very good level of satisfaction. These programs were not carried on in all steps in the entire programs. This is in accordance with Kan Inthuwong (2015) noted that technology transfer to make change in rural society in the best benefit must make the receivers believe in the technology effectiveness to convince them to open their minds and better changes or in short Adoption of Innovation. And the 5 single steps, in practice, it may not be processed all and in the same time all the 5 steps are not considered permanent behavior changes.

In producing standard textile prototype for being certified as RPC standard, each group determined their products; Mudmee, scarf, Praewa and plain. Suphannee Phornphakdi and others (2016) studied perception of consumers in The Royal Peacock standard trademark in Nakhonrachsima Province found the perception among buyers and led to buying plain and scarf.

In process of The Royal Peacock inspecting to be certified by QSDS officials found all 20 groups (100%) has certified standard from hot natural dyeing and used safety mordant or fixative as dyeing innovation to reach standard and accepted by producer group and certified by inspectors. Eco-friendly natural dyeing and mordant introduced as innovation and step forward to certification. It is in accordance with the study of Natthamon Harnsak and others (Online) that the testing of natural dyeing color fastness of silk product in standard wash of the Thai silk in RPC is in satisfaction by the standard wash with ISO 105C10:2006 standard methods.

In the same time Kotchakon Sakulborisut and others studied techniques of natural dyeing using mordant or dye fixative to improve color fastness to light and to washing by redyeing with mud, iron rust, alum or tin and as well in Preecha Moonsin and others (2021) studied and noted that natural dyeing by rubber tree's leaves had 3 different effects from 3 different mordants; alum, copper sulfate and iron rust, by which has different dyeing methods. These are mordant filling before natural dyeing, mordant filling during dyeing and mordant filling after dyeing. Silk textiles came out in different shades; with alum as mordant-given yellow color shades, in copper sulfate mordant given green-brown shades and with iron rust mordant given grey shades. In comparison the 3 different dyeing, with natural mordant filling during dyeing the shade came in darkest shade. In former study about natural dyeing, Chaiwat Kaewkhlaikhajonsiri and Prathabjai Sikka (2012) found

in indigo dyeing with bio resin from green banana sap as mordant for redyeing resulting in better in cotton color fastness and reduce dyeing times with color fastness better with light and washing than the former dyeing without the mordant redyeing. Pawinrat Saetang (2013) studied the value-added in natural-dyeing textile by using Jae Son hot spring (in MaungPan District in Lampang Province) as mordant make the natural dye given brighter shades from the natural chemical substance in the hot spring like sulfur and so on that can be natural mordants and given diverse shades and led to the product identity named 'Jae Son Mineral Water Textile' building the health benefit product from weaving.

Furthermore, natural dyeing and natural mordant is eco-friendly and health awareness production in accordance with the study of Prach Harnklar and Phornsanong Wongsingthong (2014) on the women garment design in order to develop local products to be national products using sustainable design concept for hand-woven textile of Wiang Chiang Rung District, Chiang Rai Province. It's the consumer trendy concept for natural resources sustainability to minimize adverse effect to ecosystem and hazardous waste from the beginning of production line to the sale of the worth value through the lifetime of the product.

In conclusion of the PAR evaluation and trends to develop local weaving, the participants were fulfilled their needs and satisfied with the content and results at very good level (4.08). In particular, the on-site consultation services part which, in practice, served and solved in the details of the production to enable the certifying successful and encouraging to add more certified RPC products. In increasing mutual learning process between community enterprises and the University, it played vital roles in success of the PAR project.

In Bundit Muneenaem (2013) studying the success in the OTOP Ban Phon Praewa Silk Textile from community enterprise, the factors involved were the implementation process, leaders, members, Information Technology (IT) system, production networks, good intra and inter interaction and participation of the enterprises and the most vital factor was participation of members in ongoing and dynamic production development learning processes. New skills and skillfulness from study trips and trainings involvement by officials, academic, and budget supports have improved quality of community products and standardization. In accordance with the studying of Thanyamai Jianrakul (2014) on the problems and adaptation trends of OTOP to AEC trading demanded collaboration both from government agencies and private sector in profound integration to community products standardization. In part of government agencies, it needed the most updated information about AEC, knowledge/information training and the link to low interest rate funding support agencies to reinforce community enterprises to be able to compete in domestic and oversea markets.

2. Benefit and changes expectation

2.1 Expectation from the change consequences

2.1.1 Economic changes by RPC standard at the 100% of the community enterprises target groups involved in the PAR, the community enterprises enabled to elevate their local textile products to have more products certified and inspired to diverse their productions have been increasing of the income from these standard products improve 'grassroot economy' in the end process.

2.1.2 Social changes: In the involvement of PAR activities intensively, the community enterprises improved their group involvement, particularly the participants were inspired and encouraged to have awareness in the product standardization and searching for new knowledge and information to keep on developing their enterprises' products and follow in the 'lifelong learning' concept.

2.1.3 Environmental changes: In 3 workshops participated by community enterprises' producers; program 1: OTOP standard to high quality product market, Program 2: RPC and primary quality inspecting, and Program3. Fiber preparation and natural dyeing process. The programs were made in details to improve producers' capability in natural dyeing and natural mordant to promote eco-friendly production and minimize or unuse toxic and hazardous substances to comply to the green trend, world market as 'the ecofriendly product'

2.2 Benefit utilization

Elevating the Kalasin local textiles toward RPC composed of 3 important groups working in parts; Kalasin University, The Queen Sirikit Department of Sericulture (QSDS) for standard certification, and the community enterprises. The PAR brought the best practical process and results to maintain and develop the following aspects.

2.2.1 The University and other knowledgebase agencies, from the success of 100% certified prototype product of the PAR, considered it is as encouragement to improve quality of other products and officially organize academic services office. It was to launch onsite consultation and action research as community academic services and coaching system for agriculturists and OTOP producers to adjust and sustain product development to meet the market demands in changing society conditions. The subjects related to rural community and general community development by focusing on mission and strategy. The sharing purposes and outcome benefit were designed to transfer technology and knowledge to strengthen community capacity and follow 'lifelong learning' concept leading to sustainable development.

2.2.2 Support offices; Provincial community development office, Provincial Industry office, Provincial Culture Office, Provincial Commerce Office, Promotion Centers, Regional Industry Office, and The Queen Sirikit Department of Sericulture (QSDS) could utilize the PAR action process and its model to continue standardizing community's and OTOP products. These support agencies

could bring in the action to standardize the local products integrated government budget spent and mobilize private sector supports to launch multiparty and networks to have sustainable grassroot economic development.

2.2.3 Community enterprises have benefited from products standardization, certified standard, and share their learning and technics as a learning center or as a know-how source for innovative encouragement and participative development activities. These activities; thinking, planning, and practicing to support local wisdom descending and continue cultural value in product development have been including to applicable innovation to other products to create economic values and increase grassroot community income.

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