

PROCEEDINGS

2nd International Conference on
Adaptive and Intelligent Agroindustry (ICAIA)

September 16 - 17, 2013

**IPB International Convention Center
Bogor - Indonesia**



Organized by:



Department of Agroindustrial
Technology



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2nd International Conference on Adaptive and Intelligent Agroindustry (ICAIA)
September 16 – 17, 2013, IPB International Convention Center
Bogor – Indonesia

Organized by :

Departement of Agroindustrial Technology, Faculty of Agricultural Engineering and
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George Mason University, Fairfax, Virginia, USA

Indonesian Agroindustry Association (AGRIN)

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WELCOMING ADDRESS

Prof. Dr. Ir. Nastiti Siswi Indrasti

Head of Agroindustrial Technology Department
Faculty of Agricultural Engineering and Technology
Bogor Agricultural University

On

Second International Conference on Adaptive and Intelligence Agroindustry (2nd ICAIA)

Bogor, September, 16 – 17, 2013

Assalamu'alaikum Warohmatullahi Wabarokatuh
In the name of Allah, the beneficent and the merciful,

Distinguish Guest, Ladies and Gentlemen

Let me first thank you all for accepting the invitation to participate in this 2nd International Conference on Adaptive and Intelligence Agroindustry (ICAIA). In particular I would like to thank Rector of IPB (Institut Pertanian Bogor/Bogor Agricultural University) Prof. Herry Suhardiyanto for supporting this event as part of the series academic event in celebrating the 50th Anniversary of Bogor Agricultural University.

In fact, the idea of organizing this conference was the continuation of the International Workshop on Computational Intelligence and Supercomputing Technology for Adaptive Agroindustry held by the Department of Agroindustrial Technology, Bogor Agricultural University last year.

Professor Kenneth A De Jong from George Mason University, US has successfully conducted joint international research with some staff from the Department of Agroindustrial Technology and Department of Computer Science, Bogor Agricultural University. The research aims to develop an integrated and intelligent system (namely SMART-TIN©) for the design of adaptive agroindustrial system in order to achieve a sustainable agroindustry that can mitigate global climate change and at the same time secure food, water, energy and natural medicine supply.

We are certainly proud to have been able to assemble this event in IPB, Bogor. The range of participants and audience at this conference is precisely something I would like to stress. The main goal of the conference is to provide an effective forum for distinguished speakers, academicians, professional and practitioners coming from universities, research institutions, government agencies and industries to share or exchange their ideas, experience and recent progress in Adaptive and Intelligent Agroindustry.

Distinguish Guest, Ladies and Gentlement,

Global climate change is the most challenging problems for us today and in the near future. This global change in our climate can lead to the shortage of the food, water, bioenergy and natural medicine that will affect the quality of human life. Many studies indicate that the threat of food, water, bioenergy and natural medicine crisis due to global climate change still worries our society. This problem can be solved by the development of agroindustry, i.e. an interrelated value chain entities from farming, to agro-processing industry and then to the end-customers. In fact, the design of agroindustry is complex and involves many factors and large data bases and more importantly, needs a good intelligence to process data and information to good decisions. Therefore, the way to design and manage agroindustry should be improved in order to meet the design objectives.

Agroindustries consume quite significant amount of energy on one side, on the other side they generate sizable amount of industrial wastes and its utilization as a captive energy resource is a kind of potential. Based on our study, a plywood industry with the production capacity of 200.000 m³/year could generate 32 percentage of solid waste. If this amount of waste used as an energy alternative, it may result on the saving of 131.037.768.597 rupiah per month. Similar to plywood industry, sugarcane industry with the production capacity of 480 ton per hour could generate 154 ton per hour of waste (bagasse) and this amount of waste contribute to the saving of energy consuming by 19.250 Kwh. Recent study we conducted, indicated that cassava starch industry may contribute to a significant amount of waste. It has also potential usage as an energy resource. Based on our study the conversion of its waste into energy will contribute to the saving of energy usage of 4100 liter biogas per ton material.

The three industries mentioned is only examples of how potential the role of agroindustrial waste as an alternative resource in replacing the conventional energy resource as its presence will be significantly

reduced. The new, incremental energy contributions that can be obtained from waste biomass will depend on future government policies, on the rates of fossils fuel depletion, and on extrinsic and intrinsic economic factors, as well as the availability of specific residues in areas where they can be collected and utilized. All of these factors should be in detail examined to evaluate the development of the industrial waste contribution. Hope this conference will also discuss this issue in more detail as it is an important matter for all of us. We should no more think just how to produce high value product but it is also necessarily important how to keep our live in good quality by understanding following old saying...” only when the last tree has been cut, only when the last fish has been angled, and only when the last river has been polluted, then we realized that we could not eat money”.

I do not to take up any more of your time with these opening remarks. Let me simply thank you once again for sharing your thoughts with us. Here’s wishing every success for the conference. May Allah bless all of us.

Thank you for your kind attention,
Wassalamu’alaikum Warohmatullahi Wabarokatuh

AGENDA of 2nd International Conference on Adaptive and Intelligent Agroindustry (ICAIA)

Time	Activities	Room			
Day 1 (16 September 2013)					
08.00 – 09.00 (60')	Registration				
09.00 – 10.00 (60')	Opening Ceremony <ul style="list-style-type: none"> • Welcoming Address: Prof. NastitiSiswiIndrasti (Head of Dept TIN, Fateta, IPB) • Conference Opening: Prof. HerrySuhardiyanto(Rector of IPB) <ul style="list-style-type: none"> ○ ABET Certification announcement and short ceremony ○ Launching International Double Degree Master Program in Innovation and Technopreneurship in Cooperation with University of Adelaide, Australia ○ Soft-launching Master in <i>Logistik Agroindustri</i> (Agroindustrial Logistics) 	Ballroom			
10.00 – 10.45 (45')	Opening Speeches: Prof. IrawadiJamaran (Agroindustry Guru, IPB: 25') Prof. Eriyatno (Industrial and System Engineering, IPB: 20')	Ballroom			
Session 1					
10.45 – 11.15 (30')	Keynote Speech Dr. YandraArkeman (IPB)	Ballroom			
11.15 – 12.00 (45')	Keynote Speech Prof. Kenneth De Jong (George Mason University, USA)	Ballroom			
12.00 – 13.30 (90')	Lunch Break				
Session 2					
13.30 – 15.15 (105')	Moderator: Prof. EndangGumbiraSa'id (IPB) Invited Speakers (1-4) (4 x 20 minutes) Discussion (25 minutes) Tentative Schedule: Prof. Kim Bryceson (Australia), Prof. SyamsulMa'arif (IPB), Prof. KudangBoro Seminar (IPB), Prof. HaruhiroFujita (Japan)	Ballroom			
15.15 – 15.45 (30')	Break				
15.45 – 17.30 (105')	Moderator: Prof. Marimin (IPB) Invited Speakers (5-8) (4 x 20 minutes) Discussion (25 minutes) Tentative Schedule: Dr. Gajendran (UK), Prof. Noel Lindsay (University of Adelaide), Dr. KuncoroHartoWidodo (UGM), Prof. UtomoSarjonoPutro (ITB)	Ballroom			
Day 2 (17 September 2013)					
08.00 – 08.30 (30')	Registration				
08.30 – 10.15 (105')	Moderator: Prof. KudangBoro Seminar (IPB) Invited Speakers (9-12) (4 x 20 minutes) Discussion (25 minutes) Prof. Egum (IPB), Prof. Marimin (IPB), Dr. AgusBuono (IPB), Dr. HeruSukoco (IPB)				
10.15 – 10.30 (15')	Coffee Break				
10.30 – 12.30 (120')	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; border-right: 1px solid black; padding: 5px;"> Parallel Session 1 Moderator: Prof. Fujita (7 paper @ 15 minutes) Discussion (15 minutes) </td> <td style="width: 33%; border-right: 1px solid black; padding: 5px;"> Parallel Session 2 Moderator: Prof. Ono Suparno (7 paper @ 15 minutes) Discussion (15 minutes) </td> <td style="width: 33%; padding: 5px;"> Parallel Session Moderator: Prof. Suprihatin (7 paper @ 15 minutes) Discussion (15 minutes) </td> </tr> </table>	Parallel Session 1 Moderator: Prof. Fujita (7 paper @ 15 minutes) Discussion (15 minutes)	Parallel Session 2 Moderator: Prof. Ono Suparno (7 paper @ 15 minutes) Discussion (15 minutes)	Parallel Session Moderator: Prof. Suprihatin (7 paper @ 15 minutes) Discussion (15 minutes)	
Parallel Session 1 Moderator: Prof. Fujita (7 paper @ 15 minutes) Discussion (15 minutes)	Parallel Session 2 Moderator: Prof. Ono Suparno (7 paper @ 15 minutes) Discussion (15 minutes)	Parallel Session Moderator: Prof. Suprihatin (7 paper @ 15 minutes) Discussion (15 minutes)			

12.30 – 13.30 (60')	Lunch Break	
13.30 – 15.00 (90')	Open Discussion (Open Forum) with Prof. Kenneth De Jong Topic: Foundations and Applications of Genetic/Evolutionary Algorithms	Ballroom
15.00 – 15.30 (30')	Conference Closing	Ballroom
15.30 – 17.00 (90')	Indonesian Agroindustry Association (AGRIN) National Congress (PIC: Prof. Suprihatin)	Ballroom
17.00 – 17.45 (45')	Refreshment and Closing of AGRIN National Congress	Ballroom

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Strategy To Increase Institutional Capacity Of Farmer Groups To Support The Transportation System Agroindustry Products

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ABSTRACT

Development of group processing of agricultural produce still not yet been planned better. Development of group capacities believed will be able to improve ability of group in managing products of agroindustri, including in it materials transportation and handling. This article use approach of gap analysis and analysis of prospective in developing model development of institute being based on technological incentive. From the analysis of the facility needs of the group; needs of the group is the facilitation of transport and warehousing of post-harvest cocoa. Development needs of the group is to increase management capacity, technical capacity and entrepreneurial capacity. Improved management capabilities in financial management and administration and management of the organization, while the increase in technical and professional skills to mastery and knowledge of GMP and GHP critical factors and how to handle the material as well as the appropriate mode of transportation. increase in entrepreneurial skills, especially the ability of entrepreneurs and controlling the market and business management. Dominant factors that will affect the successful development of agro-processing groups in Indonesia, namely: (1) public policy, (2) help and guidance of administrative and financial governance, (3) growth of entrepreneurship, (4) institutional strengthening, (5) special credit programs, and (6) access to funding agencies.

1. INTRODUCTION

1.1 Background

Agricultural sector is still important sector which for economics of Indonesia. Primary Product of Agriculture Indonesia such as : rice, palm oil, chicken meat, coconut, and rubber, with especial exporting products like palm oil, rubber, cacao, and coffee. Contribution of agricultural sector in PDB decrease during 20 the last year. At 2008, agricultural sector have contribution to 14,4 % in PDB (comparing with about 22,5 % at 1988 and 18,1%] at 1998) (World Growth, 2011).

One mainstay of Indonesian agricultural commodities are cocoa. Cocoa is one of the plantation commodity whose role is quite important for the national economy, particularly as a provider of employment, income and foreign exchange. Besides cocoa also play a role in encouraging the development of the region and the development of agro-industry. In 2002, cocoa has been providing employment and source of income for around 900 thousand heads of families of farmers who are mostly located in eastern Indonesia (KTI) and the largest foreign exchange contributed three subsectors after rubber plantation and palm oil with a value of U.S.\$ 701 million (Goenadi, etal, 2005). In comparison with Malaysia, cocoa derived products (chocolate) has ranked sixth in terms of resilience to the crisis and the value of agricultural commodities comparative advantage Malaysia (Ismail and Radam, 2010).

In addition to the development of commodities as inputs and agro raw material supply, we need a strong institutional groups in the region. The role of the group that became the backbone of implementing the activities of processing and marketing of

agricultural products (agro-industry) needs to be improved. Institutional strengthening is expected to drive the inputs and to maximize available resources.

Has many development programs of farmer groups and farmer group was launched by the government, many have managed to develop rural agro-industry sector. Besides, a lot of succes story in development programs and cooperative group-based agribusiness and agro-industry, but still there are improvements still need to be done (Nasution, 1992) Construction of the processing and marketing of agricultural products is essentially moving the interaction of 4 (four) variables, namely: (1) Raw materials, (2) human and institutional resources, (3) technology / tools and (4) marketing.

Community or rural human resources is synonymous with farmers or processing businesses as the subject of development and welfare should be increased revenue melalalui increased ability to conduct its business (technology, management and marketing).

Low mastery of technology by farmers or processing businesses to spur problem in adding value and competitiveness of agricultural products. Stimulus aid of appropriate technologies should be able to answer this challenge.

Institutional or institution can be defined as "the rules" (rules of the game). Institutions are also often defined as "organization" that implement rules of the game, or the player of the game or the "rules of the game that has undergone a balance" (equilibrium rules of the game). Institutional basically a formal and non-formal devices that regulate the behavior (behavioral rules) and can facilitate the coordination or interaction regulate relations between individuals. Society made arrangements to individual behavior intended that the individual does not unconstructoverall sustainability of community life. Is an example of institutional institutional exchange of goods and services through the market economy (market economy) or non-market institutions are widely available in rural areas such as profit-sharing or rental or use rights, where the distribution of the result set by mutual agreement.

Formal institutions such as laws (laws, regulations) or non-formal institutions such as many in the countryside (munaseuh, traditional institutions, villages, Pesirah, penyakapan land, debt bondage, etc) will play a role in organizing and coordinating the activities of individuals or groups of farmers towards cooperation in a rural community. But most institutional communal society in rural areas are actually capable of managing natural resources has continued towards many do not work. This is due to the number of rules of conduct or the programs that are top-down and a lot of the rules taken for granted from other countries that can not be realized in developing countries.

This paper will discuss the strategy to enhance the institutional capacity of farmer groups in support of the transportation system of agricultural and agro-industrial products.

1.2 Aim

This paper aims to formulate development strategies for the agricultural processing group supporting sitem transportation of agricultural products and agro-industry.

1.3 The scope

This paper includes the study of literature and expert opinion. Scope of discussion include:

1. Identify the critical factors of transportation of agricultural products and agro-industry in the case of cocoa.
2. Identifying factors for the development of institutional support group processing agro product transport system, by taking the case of Tanjung Fertile Farmers Group, Payakumbuh, West Sumatra
3. Growth strategy of building a model of agro-processing groups with incentives pattern technology to support transportation of agricultural products and agro-industry

2. METHODOLOGY

2.1 Understanding the institutional capacity

Increase the capacity of the country is one of the critical factors to achieve the Millennium Development Goals (MDG). Development efforts in many poor countries will fail, even if supported by an ever-increasing funding, if the development of sustainable capacity is not given the attention that more careful and bigger. It is now widely recognized by donor organizations and developed countries, which was declared in 2005, the Paris Declaration on Aid Effectiveness. (OECD / DAC 2005: "The Challenge of Capacity Development: Working towards good practice").

"Capacity" is understood as the ability of people, organizations and society as a whole to manage their affairs and development forms successfully. This definition is intentionally simple. This avoids any judgment on the goals that people choose to pursue, or what should be counted as a success in the management of their collective efforts. "Capacity" is understood as the process where by people, organizations and society as a whole release, strengthen, create, adapt and maintain capacity over time. (OECD /DAC2005:"The Challenge of Capacity Development: Working towards good practice"). New consensus, firmly in the Declaration of Paris in 2005, would see capacity as an endogenous process, strongly led from within the country, with don or splaying a supporting role. According to his vision, political leadership and political system and the government in effect is an important factor in creating opportunities and setting limits for capacity development efforts.

Thus the development of institutional capacity is an attempt or process to change/improve the institution's ability to make effective use of the way the human and financial resources are available, and creating new patterns of activity and behavior (Hidayah, 2005). Furthermore Hidayah (2005) said that the development of institutional capacity include: (1) the purpose and expectations of the group, (2) the structure of the group, (3) management group, (4) financial management, (5) group norms, (6) learning, (7) the network, (8) marketing, Muhammad Iqbal and Dalimi Azmi (2006), and (9) provision of facilities / facilities group. Institutional capacity building group is a form of empowerment through media group, because in it there are aspects of learning in order to improve the ability of HR members.

2.2 Definition of farmer groups

Basically understanding farmers groups can not be separated from an understanding of the group it self. According to Sherif and Sherif (Catwright and Zander, 1968) the group is a social unit consisting of a number of individuals that one individual with another individual have an interdependent relationship in accordance with the status and role, have norms that govern the behavior of the group members.

The group is basically a combination of two or more people who interact to achieve common goals, where the interaction is relatively fixed and has a certain structure. According to Polak (1976) the purpose of the structure of a group is the arrangement of the pattern of relationships between internal rather stable, which consists of: (1) a series of state-or position-position status members are hierarchical, (2) social roles associated with that status, (3) the elements of culture (values, norms, models) that maintains, justifies and glorifies structure. According Soekanto (1986) there are a few things that should be the hallmark of the group, namely: each member of the group should be aware of as part of a group, there is a good trade-relations among the members, and there is a factor that is shared by the members so that the relationship between them is getting stronger . Perry and Perry (Rusidi, 1987) suggests that characterize a group are: (1) there is interaction between members which lasts continuously for a relatively long time, (2) each member realizes that he is part of a group, and otherwise as members, (3) the agreement between members of the prevailing norms, espoused values and goals or interests to be achieved, (4) the structure of the group, in the sense that the members aware of the relationship-relationships between roles, norms, duties, rights and obligations of which are grown in the group.

Gapoktan (farmer groups united) is an alliance of various groups of farmers structurally similar. Economic reasons Gapoktan formation can be viewed as an effort to avoid high transaction costs to be incurred by its members because of the problems the passengers interests (free rider), commitment and loyalty are different, as well as external factors (Zakaria, 2003; Herman, 2007). Nevertheless formation paradigm Joint Farmers are less precise because it tends to make the group a formal group. Until the end of 2006 the number of farmers' groups and the group recorded 293 568 3,000 Gapoktan group. (Budi and Aminah, 2009).

An increasing number of farmers' groups have not been followed by an increase inequality, leaving many farmers group as been unable to independently or still remain to be determined from the above in various ways such as in determining the type of commodity that commercialized, market determines, determining business partners, determine the price of commodities and so on. As a result, the quality of farmer groups formed can not act as a community as set participatory rural communities, so that development has not significantly increase the capacity of the community it self to be independent in order to improve the welfare of farmers.

Tanjung Subur Farmers Group is one of farm groups included in the model Nagari Cocoa (NMK). Farmer groups already running more than 11 years and has a major effort in Cocoa agribusiness. In 2011 this group obtain assistance from Assistance (TP) budget in the form of social assistance. This aid is used to build mini cocoa factory located in Desa Kapalo Koto, Payakumbuh District South, Payakumbuh.

For business development, this group formed the Tanjung Subur Cooperative in August 2, 2005. Cooperatives and farmer groups Tanjung Subur chaired by Joni Saputra, SE with the number of members of as many as 151 people. This cooperative was formed to facilitate the form of agricultural inputs to members, for members of microfinance institutions and small business entities cocoa industry development.

In cooperative institution has an organizational structure of business financing (microfinance institutions) and parts of the business with the trademark brown CHOKATO. This cooperative effort by the chocolate does not have to maintain the structure of the quality assurance and quality chocolate are not structurally handle people who transport and storage products of members to be processe and delivered to the customer. Top of Form Governance of the paper

This paper begins with identifying the critical factors of transportation of agricultural products and agro-industry in the case of cocoa. Identification is done with the study of literature. Analysis of the results of the identification of gaps (discrepancies) between the ideal institutional competence factor necessary farmer groups with the condition currently owned by a group of farmers with farmer groups Tanjung case Fertile. Analysis tools are used to adapt this gap adopted from T-NAT (Training need Assessment Tool) developed by TAMc. Cannand J.T.Tashima(1981).

From the analysis of the gap at the top and then made models of group growth strategy with the pattern of agricultural processing technology incentives to support the transportation of agricultural products and agro-industry. This model was developed by using a prospective analysis. Prospective analysis is used to predict the possibilities that will happen in the future. Prospective analysis is not the same as forecasting because of the unpredictable prospective analysis of alternatives that will happen in the future, both positive (desirable) or negative (undesirable). Usefulness of prospective analysis is to: (1) prepare a strategic action that needs to be done and (2) to see if changes are needed in the future. Proper prospective analysis used to perancangn policy strategy (Hardjoamidjojo, 2002).

On capacity building needs analysis was conducted measurement capabilities rank specific targets, process data, interpret and rank the development needs using instruments review of training needs (PKP). There are two instruments used in PFM, namely:

1. The instrument used to measure the working ability of the target to be analyzed training needs

2. The instrument used to interpret the data collected and the ability to work has been processed.

The steps of determining the needs of development (PKP) are as follows:

1. Constructing competence required by the Cooperative Agro-industry in the are of globalization and free, as well as the characteristics or traits of each of these competencies.
2. Creating an instrument to measure work ability. This instrument is used to measure the ability of the necessary work both in office and on the job or the necessary competence scale (SKD) and the ability of private employment or current competence scale (SKS). Measurement of competency ratings done quantitatively using a scale score of 0 to9. This scale is divided into three ratings:
 - a. Scale0-3: RatingSKD/SKSLow
 - b. Scale3-6: RatingSKD/creditsare
 - c. Scale6-9: SKDranked/highSKS

To measure the level of SKD or credits used indicator. Indicators are divided into 3 groups according to division and SKDSKD rank above.

1. To measure the level of competency. In measuring the level of competency, respondents drawn from cooperative development experts.
2. Process the measurement data and interpret the results of data processing. Data processing results processed with the help of tables of data processing. Each of the features (characteristics) calculated the average competence ratings SKD and his credits from a number of respondents who fill the questionnaire. Average ratings SKD and credits calculated as follows:

$$\text{SKD or SKS} = \frac{\sum_{i=0}^9 (i \cdot n_i)}{N}$$

where: i = the value scale
 ni = number of respondents who rate scale i
 N = number of respondents overall

Development needs are determined by using the difference between SKD and credits. If SKD - SKS > 1 then the development needs to be done.

3. Rank the needs of development. The level of development needs determined by plotting the average value of SKD and credits for each of the features in the following diagram. SKD rank values on the horizontal axis and the value of credits ratings on the vertical axis.

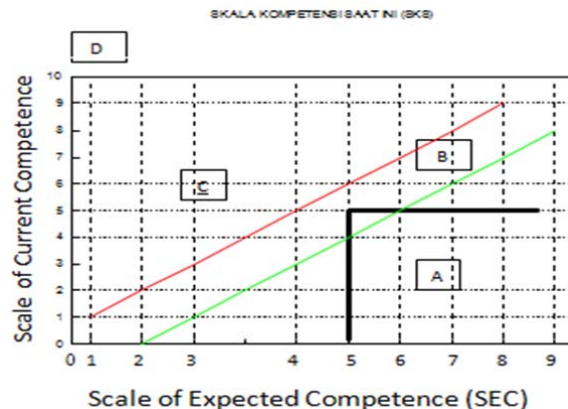


Figure 1 : Diagram rank group development needs

Field A: competence is urgent / very need for improved
 Field B: competence urge / need to be improved
 Field C: competence does not need to be upgraded
 Field D: the ability to group progress

2.3 Identification of Critical Factors Transportation Agriculture and Agro Products and Institutional Development In Case of Cocoa

Cocoa processing industry is one of the prospective industries that add value to the economic income communities. In Indonesia, cocoa and other dairy products showed good prospects. One of them goes back to the government to implement export duty on export of cocoa beans per 1 April 2010. Since then the Indonesian cocoa industry to increase production capacity significantly, as shown in the table 1.

Table 1. Capacity Productivity

Information	Year			
	2009	2010	2011	2012
Capacity Productivity (ton)	125.000	150.000	280.000	400.000
Increasing		20%	87%	43%

Annotation : 2009 before determination of export tax
 2010-2011 : after export tax determination
 *) prediction

Table: Comparison of production capacity before and after the establishment of the cocoa export tax

Of the cocoa supply chain analysis (Figure 5), we know apat critical factors of quality decline in cocoa may occur at the farm level (low quality cocoa beans), then shrinkage caused by factors that do not transport well, seed damage due to incorrect handling. Because it is necessary for the selection of the proper mode of collecting cocoa and storage in a warehouse. Modes of transport should not be moist and have adequate ventilation.

At the processing level of quality chocolate penutrunan may occur during transport intermediate products and finished products. Among such products are brown pasta, brown fat and cocoa powder. Deterioration due to improper handling, use of improper transportation will reduce the quality of the product. Cocoa products containing cocoa butter should be posted in the solid state. It means that the environment temperature should be below body temperature (below 35⁰C). It required a mode of transport that can keep environmental conditions at that temperature.

This information needs to be known by the cooperative board so that the quality of raw materials and final product quality can be maintained. Based on interviews with officials of the Department of Agriculture Payakumbuh, this time to use the processing power that remains by the Cooperative. It's just the knowledge of the handling and processing of materials is still lacking.

In addition to the above technological problems relatively weak in terms of institutional management. This is evident from the weak administrative systems are applied. Various types of books filled group administration is not complete, and some of which are not yet available book. Awig awig governing the rights and obligations of members not yet available. For the training done, coaching and mentoring to strengthen the institutional group. Similarly, in the marketing of chocolate and cocoa (Suwardi, et al., 2012).

Institutional strengthening efforts of farmer groups is a job that does not light, even takes time and financial resources. However, the institutional strengthening should be done for farmer groups to self-reliance. In connection with this, then it is necessary to strengthen farmer groups, among others.

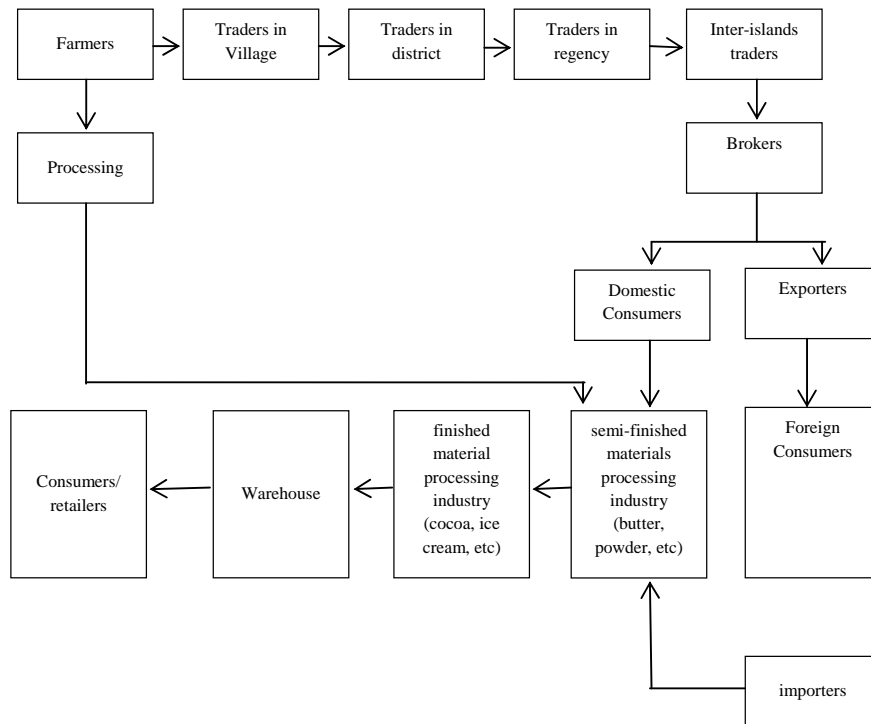


Figure2: Cocoa Supply Chain

Creating a favorable climate within the farmer groups, such as mutual trust, mutual support among members of farmer groups, between farmer groups, farmer groups within (extension agents, other officers) so that the formation of the group was able to establish and develop the participatory farmer groups (of, by, and for farmers);

- Develop creativity and initiative of members of farmer groups to take advantage of every business opportunity, information and access to capital are available. This can be done by increasing the ability of group members to make changes through rational thinking, open to new ideas, science and technology oriented, recognize excellence, efficient, productive, have a calculation to act and take decisions based on their own judgment and not fatalistic.
- Helps to accelerate the process of identifying needs and problems as well as to plan and solve problems encountered in farming. To that end, the farmer groups need to be equipped with the skill sof the steps that must be taken in identifying and solving problems by utilizing information sources are accurate;
- Improve the ability to analyze the market potential and business opportunities as well as analyze the potential areas and their resources to develop a commercialized commodity in order to provide greater business profits. This canbe done by improving farmers access to information group. To that end, the development of information systems through the wider networks is essential to farmer groups can be more responsive to the changes in progress in the field of agriculture.
- Improve the ability to manage commercial farming, sustainable and environmentally friendly. This can be done by foster cooperation among members of the farmer group. Cooperation of every member involved can bedirected to be able to interact to improve the capabilities and performance of business sustainable;
- Improve the ability to analyzethe business potential of each member to serve as a business unit to ensuremarket demand, in terms of quantity, quality and continuity. This can be done by putting the guidance and support that is directed to members of the group want to learn and try something new innovations;
- Develop the ability to create specific local technology. This can be done by encouraging healthy competencies of members of local groups to create specific

technologies. This is where the importance of farmers' groups to give confidence to members in the practice of agricultural technology in accordance with their respective business;

- Encourage and advocate for farmers willing and able to carry out activities of savings and loans in order to facilitate the development of venture capital. This can be done by encouraging, motivating and raising awareness to develop the group's capital. In addition, the provision of assistance in the form of capital credits to members of the group is also important to assist them in developing the venture capital by utilizing the skills they had in an attempt to increase its income.

Based on the above matters and information from farmer groups Tanjung Subur development group then needs to do is:

Tabel 2. Identify Factors Institutional Development Group Processing For Farmers Group Tanjung Subur, Payakumbuh, West Sumatra

Competencies	Characteristics
Management development	<ol style="list-style-type: none"> 1. Administration and finance 2. HR management 3. Management organization
Infrastructure Needs	<ol style="list-style-type: none"> 1. Transportation and warehousing 2. Processing facilities 3. Marketing tools 4. Office administration tools
Technical and Professional Capacity	<ol style="list-style-type: none"> 1. Mastering quality assurance of agricultural materials 2. Mastering GMP and GHP 3. Master the critical factors and material handling as well as a mode of transportation
Understanding the Principle of Cooperatives	Understanding the cooperative principle and helpself
Member entrepreneurship	<ol style="list-style-type: none"> 1. Have the ability to self-employment 2. Knowing the principles of business management 3. Oriented to customer satisfaction 4. Responsiveness to market demand 5. Considers relationships as partners

2.3 General Conditions of HR Agriculture

Agricultural human resources, both personnel and non-personnel agriculture (the main actors and businessmen), has a strategic role in realizing the four successful agricultural development. General conditions of agricultural MAIN ACTORS In terms of education, based on data from the Central Statistics Agency (BPS) in 2010, of a total of 39,035,692 of the main actors of agricultural development (farmers), 15,023,269 people (38.49%) finished primary school educational background; 10,358,754 people (26.54%) did not / do not complete primary school; 6.3308 million people (16.22%) completed SMTP; 332,106 people (8.54%) graduated from high school, and 223,809 people (0.57%) College graduate (undergraduate and graduate). In addition, there were still 3,766,954 people (9.65%) has not been to school or not.

This shows that in terms of education, the quality of the main actors of agricultural development is still low, so that the necessary efforts to improve the quality of education. Black (2010) proposed a more comprehensive education in school classes about the importance of safety in driving and includes the development of security aspects in the transportation of agricultural materials. Disaranan media besides training in the classroom is through brochures and television.

Distribution of the main actors of agricultural development based on educational background can be seen in Figure 3.

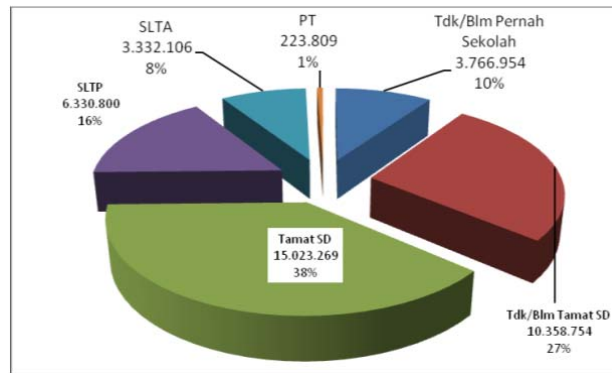


Figure3 : Main actors of Agricultural Development Based Educational Background

2.4 Development Needs Determination (PKP) for Cooperative Agro-industry

From the analysis of PKP, the obtained values recapitulation SKD and credits for each of the features of each competency as shown in Table 5. If the value of SKD - SKS > 1, then the competencies needed to be trained on the cooperative members. From result analyze PKP, hence the Obtained [by] SKD and assess summary of credits to the each characteristic from each; every interest like seen [at] Tables 5. If value of SKD - SKS > 1, hence the interest require to be trained [at] co-operation of the members. Table 3. Recapitulation value SKD and SKS

Tabel 5. Development Needs Determination (PKP) for Cooperative Agro-industry

Competencies	Characteristics	SKD	SKS	Difference
Management development	Administration and finance	7,02	5,74	1,28
	HR management	6,50	6,44	0,06
	Management organization	7,00	5,64	1,36
Infrastructure Needs	Transportation and warehousing	7,08	4,88	2,20
	Processing facilities	6,50	6,48	0,02
	Marketing tools	7,14	7,12	0,02
	Office administration tools	7,88	7,66	0,22
Technical and Professional Capacity	Mastering quality assurance of agricultural materials	7,48	7,48	0,00
	Mastering GMP and GHP	7,74	6,18	1,56
	Master the critical factors and material handling as well as a mode of transportation	7,32	6,28	1,04
Understanding the Principle of Cooperatives	Understanding the cooperative principle and helpself	6,58	6,18	0,40
Member entrepreneurship	Have the ability to self-employment	7,54	5,60	1,94
	Knowing the principles of business management	6,70	5,60	1,1
	Oriented to customer satisfaction	6,56	5,70	0,86
	Responsiveness to market demand	7,96	5,04	2,92
	Considers relationships as partners	6,98	6,48	0,50

Notes :



: Needs to develop

SKD : Scale of expected competencies
SKS : Scale of current competencies

From the analysis above is known that increased its capacity of processing facilities and infrastructure are still needed by the cooperative are transportation and warehousing. Srana other instrumentalities such as cocoa production and marketing facilities are met through support both national and local government. Assistance provided should be accompanied by knowledge of the handling of cocoa and chocolate products, and there should be a section that is responsible for pebggunaan this means. In parts of the structure must be included warehousing and quality assurance section. Besides, it is also necessary accompanying training aid.

Selection of agro-industry technology to implement the technology on local processing operation (indigenous technology) based on local resources. The main criteria in the selection of technology: (a). Quality requirement (b). Processing requirements (process requirements). (c). The use of capacity (capacity utilization). (d). Capacity management capabilities (management capability)

Empowerment of rural institutions also consider the utilization factor of the provision of the means of production, raw materials and skills held by people (including pricing discretion, affordable public services, fostering wisdom rural industries). Capital and investment discretion should be tailored to the principles of scarcity and subsidy policy, in order to reduce the negative impact of the application of the use of capital goods in rural areas. In essence, the approach and the strengthening of rural communities to engage in institutional empowerment is to give full space to articulate themselves and their environment, so it can find and arrange their own buildings themselves and their environment; appropriate social realities of rural communities (Elizabeth, 2007).

From this analysis shows that the ability of the management of the organization, administration and finance are things that need improved capacity. Another improvement that needs to be done is to increase technical capacity of processing and business management.

Nofialdi, et. al. (2012), proposed the development of cocoa in West Sumatra Nagari level by using the selection of appropriate technologies, funding from government and institutional cooperative and the cooperative form of business or cooperation between cooperatives and investor.

Margono (1995) argues that the essence of leadership is influence the behavior of others, can be sourced from one or a few people or a particular situation (environment or objects). Leadership that comes from a person, that person may be placed as a formal leader (official) or informal (unofficial), or regular status. According to Bass (1990) leadership is an interaction between two or more members of a group that often includes the preparation of a structure or structural alteration of the situation and the perceptions and expectations of members. Leaders are agents of change-one that can be compared with the other influence that affects him.

Leadership comes when one member of the group can motivate or give competence to the others in the group. By looking at the various definitions of leadership by Wahjosumidjo (1992), the meaning of leadership will essentially include: (1) leadership is something inherent in a person a leader that certain traits such as personality (personality), ability (ability) and ability (capability), (2) leadership is a series of activities (activity) that leaders can not be separated by position (position) as well as the style itself or the behavior of the leader, and (3) leadership is a process of inter-relationships or interactions between leaders, subordinates and the situation.

The existence of a strong positive relationship between leadership and group effectiveness group leader can be observed from the results of research in the field. From field observations and data obtained showed that the leadership group to age group goes well will be followed by effective farmer groups. It typically can be seen in Cape Subur

Group. Similarly, the leadership group to age group have not been completely worked well or quite enough will be followed by a not so effective as he leads a group of them. These results are very consistent with the opinion of Bass (1990) which states that the leader (the group leader) is an agent of change-one that could be affecting that. Leadership is an interaction between two or more members of which often include structural drafting or revising the structure of the situation and the perceptions and expectations of the members. Therefore leadership will emerge when one member of the group (group leader) can motivate or give competence to the others in the group.

Chairman of Tanjung Tani Subur group has strong leadership and entrepreneurship. It is seen from breakthroughs made and lobby government and NGOs. Chairman of the leadership group that is fair or very high will provide a significant opportunity to achieve effectiveness in the lead group. This is possible because of the leadership group leader either very high or has a better ability or higher in influencing other members. It is included in the structuring or alteration of structures that are aligned with the perceptions and expectations of the members to achieve success. Leadership in the group classified as good or very high, the group's success in achieving its goal, the moral state of the group members and the level of satisfaction of the members proved to be better or higher than the group whose leadership has not gone well. Therefore, if you want to see the head of the group can execute with good leadership should have been competent parties such as the department of agriculture better role in facilitating group with diverse activities. In this case the extension field can act as catalyst, dynamist and motivator.

3. MODELS GROUP DEVELOPMENT STRATEGY OF AGRICULTURAL PRODUCTS PROCESSING TECHNOLOGY WITH PATTERN INCENTIVES TO SUPPORT TRANSPORTATION AGRICULTURE AND AGRO PRODUCTS

In order for the development of groups such as the above can occur, based on the description above, the identified success factors of growth of farmer groups in Indonesia. Success factors growth in Indonesians based on secondary data and expert opinion stake holders are: (1) public policy, (2) training, (3) technical assistance, (4) access to financial institutions, (5) technology incentives, (5) growth leadership, (6) growth entrepreneurship, (7) institutional strengthening, (8) administrative requirements, (9) and scale (10) special credit program. The definition of each of these factor can be seen in the following table.

Table 4. Definition of success factors in the development of Indonesian Gapoktan

Factors	Definition
Policy	Government policies on growth and processing group separation of groups / farmer group
guidance technology	Technical guidance on mastering the technology by group
access to capital	Aid agencies access to capital or surety partners (AVALIS)
technology incentives	Direct aid equipment and processing machinery
Leadership	Growth of leadership within the group
Entrepreneurship	Entrepreneurial growth in the group
institutional strengthening	Growth solidity and solidarity groups
administration	Assistance and guidance of management administration, bookkeeping and financial governance
Special credit program	Special credit programs for groups

By using the combined assessment of stakeholder opinion then obtained dominant factor that will affect the successful development of agro-processing groups in Indonesia, namely: (1) public policy, (2) support and administrative guidance and financial governance, (3) growth of entrepreneurship, (4) institutional strengthening, (5) special loan programs,

and (6) access to funding agencies. Growing success factor analysis based stakeholder analysis can be seen in Figure 4.

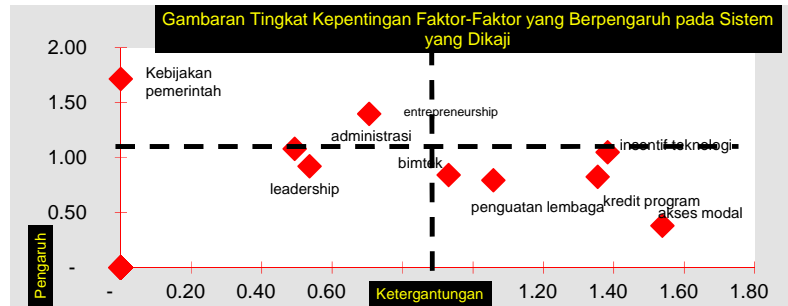


Figure4. Growing success factor analysis Poklahastan based stakeholder analysis can be seen in

3.1 Poklahastan Growth Strategy Formulation and Development Operational Recommendations Poklahastan

For the six key factors mentioned above will be selected circumstances (state) that may occur in the future. It is intended to predict the likelihood that these factors may occur in the future, whether it will evolve into a better direction of the current, fixed or will be worse than the current situation. These results can provide awareness for policy makers to execute the chosen strategy.

Of circumstances which may occur for each of the key factors need to be restricted to first state that may not occur simultaneously (mutually incompatible). The table in Appendix 1 and 2 show the selection situation that may occur in the future for all 6 key factors and options that a state may not occur simultaneously.

Based on the circumstances in Table 7, first sought all possible combinations of circumstances that can not occur simultaneously. As an example, namely: (1) the absence of any special credit (1A) is not likely to occur simultaneously with the increase in access to financial institutions because of the mentoring and socialization, because monetary policy unchanged.

Table 6. State Gapoktan Future Development

Factor	A	B	C
Government policy	Fixed, Gapoktan function unite in Off-farm and on-farm	Changing, make Poklahastan be special unit of Gapoktan	Changing, to build new institutional beside Poktan/Gapoktan
Administration and financial management	Fixed, mentoring services are still a project	Intensive services with the establishment of cooperation between the government and other institutions	
Entrepreneurship	Entrepreneurship not growth in groups	Entrepreneurship, grow but personal interesting still dominant	Entrepreneurship to be group life
Institutional strenghtening	Fixed, no change	Fixed but in better management	Rise to small / medium scale
Special credit programme	There is no special credit for SMEs	Remain as it is now, there are special credit and limited	There are special credit-backed government policy
Access to funding agencies	Remain as at present, difficult to reach	Increases with the mentoring and socialization	

Table7. The situation is not likely to occur simultaneously on the Development of SMEs in the Future

No	Factor	A	B	C
	Government policy	Fixed, Gapoktan function unite in Off-farm and on-farm	Changing, make Poklahastan be special unit of Gapoktan	Changing, to build new institutional beside Poktan/Gapoktan
	Administration and financial management	Fixed, mentoring services are still a project	Intensive services with the establishment of cooperation between the government and other institutions	
	Entrepreneurship	Entrepreneurship not growth in groups	Entrepreneurship, grow but personal interesting still dominant	Entrepreneurship to be group life
	Institutional strenghtening	Fixed, no change	Fixed but in better management	Rise to small / medium scale
	Special credit programme	There is no special credit for SMEs	Remain as it is now, there are special credit and limited	There are special credit-backed government policy
	Access to funding agencies	Remain as at present, difficult to reach	Increases with the mentoring and socialization	

Based on the circumstances that have been made in the previous stage then drafted alternative possible scenarios for future growth Poklahastan. In this paper, discussion is limited to 4 proposed scenarios tend optimistic, pessimistic, moderate and fixed. It is intended as a representation of an example of the application of a prospective analysis in order to generate operational recommendations

Table8. Growth Scenario Poklahastan

Scenario	
Optimistic	1C-2B-3C-4C-5C-6B
Pesimistic	1A-2A-3A-4A-5A-6A
Moderate	1B-2B-3B-4B-5B-6B
Fixed	1A-2A-3B-4A-5B-6A

Strategic priorities for the results Optimistic scenario is government policy that encourages growth and development of agro-processing groups. This strategy encourages optimistic scenario, which is available exclusively for groups Poklahastan loans backed by the government's policy (1C), mentoring can provide intensive services with the establishment of cooperation between the government and other institutions (2B), Entrepreneurship into soul groups (3C), be strong and incorporated (4B) and access to financial institutions that have increased with the mentoring and socialization (5B).

When that will happen is a pessimistic scenario where there is no government policy to foster Poklahastan (1A), the project is still a caring ministry (2A), entrepreneurship does not grow in clusters (3 A), scale remains as it is to day and access to financial institutions are difficult to reach (5 a) then the policy makers should strive to avoid the occurrence of such a thing.

If the moderates cenario happens (1B-2B-3B-4B-5B-6B), the thing to note is the policy-making as a special unit with in Poklahastan/Gapoktan be autonomous and independent in the future. Poklahastan growth can be started from embryo splitting focus group of on-farm (aquaculture) to processing (off-farm).

If the scenario remains as currently is the case then that should be considered by policy makers in order not to fall into a pessimistic scenario is the growth of entrepreneurship in the group. Emergence Technopreneurship candidates in the future will

be able to strengthen the group and ensure that it remains sustainable processing group in the future.

In implementing this strategy, it is necessary operational steps as follows:

- Step I; encourage and guide farmers to be able to cooperate in the field of economics in groups. Members of the group should be made up of farmers who have the same interests and mutual trust, so it will grow compact and harmonious cooperation. Guidance and assistance provided by the agency ease builder or other party must be able to grow the independence of the farmer groups.
- StepII; develop farmer groups through: (1) an increase in facilitation and access to capital for farmers in terms of scale development, (3) an increase in bargaining power (bargaining position) through consolidation in a container farmer groups to unify the economic movement in groups in each supply chain, from pre-production to marketing. (4) increasing facilitation and support to the organization of the group, and (5) an increase in farming efficiency. Wahyu (2009) proposed institutional integration at the farm level for performance optimization encouraging agricultural development. Integration can be done for example integrate assistance for extension workers and farmer groups in a common container.
- StepIII: improving human resource capacity of farmers through various mentoring activities, and exercises designed specifically for the management and members, such as entrepreneurship courses, participative management and the development of achievement motivation internship/study. The farmer capacity building needs serious attention, especially its development efforts should be done in an integrated and comprehensive so that the existence of farmer organizations to improve the welfare of farmers, not used as a riding horse for the sake of political, social and economic certain parties.

In strengthening farmers' groups, is technically done by Extension Pertanian (PPL). Never the less coaching mentoring farmer group scan also be done by NGOs, and other organizations deemed capable and experienced incommunity development. In this case the companion task is to develop participation, attitudes, knowledge and skills of farmers' groups and members in achieving the mutually agreed goals.

5.CONCLUSIONS AND RECOMMENDATIONS

From the analysis of the development needs of the group; needs of the group is the facilitation of transport and warehousing of post-harvest cocoa. Development needs of the group is to increase management capacity and entrepreneurial capacity. Dominant factors that will affect the successful development of agro-processing groups in Indonesia, namely: (1) public policy,(2) help and guidance of administrative and financial governance, (3) growth of entrepreneurship, (4) institutional strengthening, (5) special credit programs, and (6) access to funding agencies.

Of dominant factor and grow the factor governmental entrepreneurship policies are all factors that must be considered to beo ptimistic scenario or a pessimistic scenario does not occur in the future.

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