

WELFARE IMPROVEMENT MODEL THROUGH FOREST FUNCTION RECOVERY, THE STRENGTHENING OF SMALL ENTREPRISE PERFORMANCE AND THE FARMER'S PARITY: STUDY IN LAMPUNG PROVINCE-INDONESIA[#]

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ABSTRAK

Sekalipun menurut Naidoo (2004) deforestasi merupakan proses yang lumrah bagi negara-negara berkembang untuk memperoleh modal dalam awal pembangunannya, namun di Provinsi Lampung, deforestasi nampak telah melampaui nilai ambang sehingga fungsi intrinsik hutan telah begitu merosot, kesetimbangan ekologis menurun drastis (Nyhus dan Tilson, 2005) yang dapat menekan polenisasi tanaman bijian (Arief, 2011) dan menekan hasil pertanian. Kecuali itu Bakri (2012) juga mencatat deforestasi ini juga telah meningkatkan frekuensi banjir di musim hujan dan kekeringan di musim kemarau selanjutnya juga telah menekan kinerja sektor pertanian, industri serta melambatnya perkembangan MSME maupun menekan kesempatan kerja bagi masyarakat (Bakri, 2012). Karena itu seperti dapat diperiksa dalam data BPS (2000-2016) kesejahteraan masyarakat Provinsi Lampung selalu tertinggal dari rata-rata nasional. Bahkan menurut BPS (2014) sebagai provinsi yang paling rendah di Sumatera dari sisi indeks Nilai Tukar Petani (FPI) maupun Indeks Pembangunan Manusia (IPM)-nya. Berangkat dari masalah ini maka dilakukan penelitian ini dengan tujuan: [1] Merumuskan model kebijakan peningkatan kesejahteraan masyarakat melalui skema pemulihan fungsi hutan, pengembangan kinerja MSME dan peningkatan daya beli petani. [2] Mengembangkan model kebijakan fiskal daerah (Belanja Publik, Belanja Pegawai, dan Belanja Sosial) yang dapat menstimulasi kinerja MSME dan kesejahteraan masyarakat secara makro di Provinsi Lampung. Penelitian akan mulai Mei samapai Oktober 2016 dengan melakukan interpretasi citra satelit Landsat ETM7+ rekaman tahun 2000, 2002, 2006, 2009, dan 2013 disertai akuisisi data perekonomian BPS (2000-2016) maka dibangun 8 model persamaan simultan yang dimulai dengan mengambil perubahan variabel tutupan hutan negara [HN] dan hutan rakyat [HR] sebagai variabel penjelas terhadap pertumbuhan sektor pertanian [INCOMP_AGR] dan berturut-turut sebagai variabel bagi pertumbuhan sektor industri [IND_GW], bagi kinerja nilai tukar petani [NTP], bagi kinerja [MSME] dan bermuara bagi kinerja [HDI] Provinsi Lampung. Selanjutnya perlu dirumuskan [MSME] sebagai penentu pertumbuhan ekonomi yang sehat [ECON_GW]. Simpulan: (i) tiap ada 1% reforestasi pada [HR] akan meningkatkan [INCOMP_AGR] sebesar Rp 9.26 Juta/tahun, (ii) tiap kenaikan [INCOMP_AGR] mendahului kenaikan sektor industri [IND_GW] sekitar 4.7%. (iii) tiap kenaikan 1% [IND_GW] maka pangsa sektor industri [IND_SH] naik 0.12%, (iv), jika [IND_SH] naik 1% maka akan tumbuh UMKM 20 unit/10ribu penduduk, (v) bila [UMKM] tumbuh 1unit/10ribu penduduk maka pertumbuhan ekonomi [ECON_GW] akan naik 0.013%, (vi) Bila [ECON_W] naik 1% maka daya beli petani [NTP] akan meningkat sebesar 10.5 satuan, (vii) bila [NTP] naik 1 satuan maka [IPM] akan naik 0.147 satuan; dan (viii) tiap Rp 1M belanja sosial pemprov [SOS] 2 tahun kemudian akan meningkatkan [MSME] sebesar 2.28, sementara belanja publik di awal [PUB] malah menurunkan 2.22 unit/10ribu penduduk adapun belanja pegawai tidak nyata.

ABSTRACT

Deforestation was the changing process an forested area to became non forested one. According to Naidoo (2004) was a normal process that liquidation forest resource in some regions in the third world tropical countries when they began development programs, and so did in Lampung Province-Indonesia. Anyhow in Lampung Province, the deforestation seems to have exceeded the threshold rate so that their ecological functions underwent deterioration, produced an ecological shock or disturbance (Nyhus and Tilson, 2005), which can suppress the grain crop polenization by bees (Arief, 2011) and then suppressed some agricultural output. Besides, Bakri (2012) also noted that deforestation has also been increased in flood event in the rainy season and drought in the next dry season then has also undermined the performance of the agricultural sector, agriculture-industrial input accompanied by slowing the SMEs development as well as lessening job opportunity for the people (Bakri, 2012). Therefore, as it can be confirmed in the data of Central for Statistical Bureau or BPS (2000-2016) that during 3 decades Lampung welfare left behind from national average. Even nowadays is the lowest among the 8 provinces of Sumatera in terms of it HDI as well as it farmer's parity index [FPI]. Based on these phenomena we conducted tis research aimed at: [1] formulating model how to increase the welfare through reforestation scheme, the developing the SMEs performance as well as increasing FPI, and [2] developing models of local fiscal policy (public investment, apparatus expenditures, and social safety net budget) to stimulate the performance of SMEs and the public welfare. The study began in May to October 2016. The Landsat satellite images of ETM7+ (recorded in 2000, 2002, 2006, 2009, and 2013) was downloaded at www.usgs.gov. then interpreted at the Laboratory of Forest Resource Inventory, Lampung University to separate among the spatial distribution of state own forest cover [SF], people own forest covers [PFI], and the other land uses. We then validated by field check surveyed. We also collected the economic data from BPS (2000-2016). We then built 8 simultaneous equation model that starts by taking a variable changes state own forest cover [SF] and the people's forest covers [PFI] as explanatory variables for the income per capita of agricultural sector [INCOMP_AGR] and successively as a variable for the growth of the industrial sector growth [IND_GW], for the [FPI], for the performance of [MSME] and for the [HDI]. Subsequently we also formulated the [SMEs] as a determinant of healthy economic growth [ECON_GW]. The conclusions: (i) the reforestation by 1% at the [PFI] area, it would increase the [INCOMP_AGR] Rp 9.26 million / year, (ii) any increase in [INCOMP_AGR] precedes the increase in the industrial sector growth [IND_GW] at about 4.7%. (iii) each increasing by 1% the [IND_GW] it would make the share of the industrial sector [IND_SH] gained by 0.12%, (iv), if the [IND_SH] rose by 1%, it would grow the [SMEs] by 20 units/10thousands population, (v) if the [MSME] grow 1 unit /10 thousands population, the economic growth [ECON_GW] would rise by 0.013%, (vi) when the [ECON_GW] rose by 1%, the [FPI] would increase by 10.5 units, (vii) if the [FPI] raised up by 1 unit, of the [HDI] would increase up by 0.147 units; and (viii) if the social spending of provincial government [SOS] increased by Rp 1M, the next to 2 years would increase [MSME] by 2,28unit/1,000 people.

Key words: *people forest, economic growth, farmer's parity index, MSME, provincial fiscal, HDI*

INTRODUCTION

Background and Research Problem

Since the era of government reformation and the centralization, the economy performance indicator in Lampung Province is always below the national average. In other word, for the last 15 years, the society welfare in Lampung Province fall behind the others. As summarized by BPS (2001-2016) that from 2000-2008 [moving to 2009-2013], the gross domestic product (GDP), economic growth, and poverty portion is Rp. 4.4 million [to 5.6 million], 4.9% [to 5.2%], and 21.6% [to 16.1%], respectively. While on human development index, from 2010 to 2015 moved from 64.2 [to 66.95]. Those gaps look significant if the four mentioned indicators are compared to the national average on the same period: Rp. 8.1 million [to 14.2 million], 5.5% [to 5.9%], 16.1% [to 11.7%], and 66.53 [to 69.55], respectively. Even more, in 2010, Lampung Province is the third poorest Province, below Bangka-Belitung (as the youngest Province) and Bengkulu. Moreover, recently it is dropped to the poorest of 10 provinces in the region. The question is to look for the substantial answer on public policy level, especially regarding the ethics and alignments in the future planning, so that Lampung Province can fill all of the gaps. In order to understand the cause of the gap, reference on relevant academic study is needed. After the cause is understood, it should become the foundation of the reorientation and establishment of future planning.

One of the most relevant academic study is done by Affandi (2009). In this study, Affandi proves that there are 12 agroindustry sectors that agglomerates on the downstream of Lampung Province, which is around Bandar Lampung, Metro, Pringsewu, Kota Bumi, Bandar Jaya, and Mesuji. Agglomeration (clustering) of several economic activities is industrialists' behavior to do their activities close together to achieve some efficiency through the easy access to raw materials, labors, and other resources (including knowledge capital) in order to maximize profit (see Krugman, 2010b).

However, in the case of Lampung Province, these agglomeration is not supported by compatible public policy, thus the performance is not satisfying. The symptoms of bad public policy was analyzed and proven by Affandi (2009), the return to scale (RTS) of the twelve agroindustry groups are decreased (DRS: decreasing return to scale), that is only 0.88. This means that if the four input factors for production (capital, raw material, labor and energy that each represented by monetary value) is increased by 1%, the total output will be only 0.88%.

Furthermore in the reality, input factor of capital and energy only responds to a relatively low output, 0.05 and 0.17, respectively. Meanwhile, for input factor of raw material and labor responds quite well towards their outputs: 0.32 and 0.34, respectively. This means that the average of twelve agroindustry sectors still has the positive respond to the increase of input factor of raw material and labor, but not quite positive to the increase of capital and energy input.

Because of the data used by Affandi's (2009) analysis is a long term data (1988-2005), this phenomenon could give us insight about the scarcity of raw materials. In the terms by Iglioni (2012, cited by Bakri *et al.*, 2014), this phenomenon shows the congestion on demand or excess towards the raw material. This insight is supported by the performance of food industry elasticity. Elasticity of raw material input for the food industry can reach 0.93, and meanwhile for the capital, labor and energy input is 0.10, -0.12, and -0.01. This means the labor and energy input in food industry reach the saturation, the capital input is close to the saturation, and raw material input is still responsive to the output increase. Congestion in demand for raw materials affects the food industry to reach decreasing return to scale, which is 0.89 (below 1.00). The fact on raw material congestion is also proven by the rate of agriculture sector growth on 2000-2008 (BPS Lampung, 2009) that is always lower than the agroindustry sector (4.3% versus 5.2%).

This fact proves that the agglomeration of agroindustry sectors on those downstream areas is not supported by compatible public policy. This sector, which is a stepping stone on economic structural transformation from agrarian to industrial culture, experience: (i) growth stagnancy, (ii) unable to absorb low marginal productive and negative labor, (iii) unable to do multiplier effect of economic activity to the other sectors (such as agriculture, trading, transportation, tourism, etc.), means it cannot stimulate entrepreneurship performance. This is not a good fact since Hien (2010), Krugman (1991, 2010a, 2010b), and Hayami and Godo (2006) states that the entrepreneur groups are the main absorber of labor, which leads to the increase in income, economic growth and the poverty alleviation. Finally, it leads to the gap in Lampung Province welfare compared to national average that is indicated by welfare indicators (GDP, economic growth, poverty portion, and human development index), and still continuously fall behind from national and Sumatera region average.

To construct a policy that is compatible with those agroindustry agglomeration process, a further study and analysis is needed. Remembering the fact that agglomeration is a spatial process from various agroindustry economic activities to take place in the downstream area, it is fair to navigate the analysis towards this province's upstream-downstream relation. As the LREPP I=*Land Resource Evaluation Planning Project I* (CSR, 1989) states that the western part of Lampung Province is a plateau and has denser rainfall compared to central and eastern region, which are generally where the agroindustry activities takes place.

Along with that spatial reality, unfortunately, the upstream of this province has experienced an acute deforestation. As reported by Forestry Agency of Lampung Province (Dishut Provinsi Lampung) (Watala, 2008, followed by Bakri, 2012), the average damage on production forest, limited production forest, and protected forest are 71%, 76%, and 80%. Even more, for a strictly conserved region, Tahura, TNWK and TNBSS has experienced degradation to 70%, 34%, and 16%. This fact leads to the decline of ecological equilibrium in Province Lampung as a whole (Nyhus and Tilson, 2005). This includes a serious ecological damage, one of them is disturbance of bee habitat. According to Arief (2011, cited by Warsito, 2011), more than 90% of cereals (a group of grain-producing plants) are done by bees, and because of that this scholar concludes that the absent of bee means the absent of life.

With this series of argumentations it can be inferred that deforestation (especially in upstream region) has driven the ecological equilibrium downwards, pressing agriculture sector productivity and performance, continued by the agriculture sector cannot supply the agroindustry raw materials, a stagnancy in agroindustry, low labor absorption, undeveloped entrepreneurship, a lasting poverty, and finally a lagging human development index. Because of that, the first root of problem that is needed to be revealed is: the recovery of forest ecological function which is a public domain that further leads to the duty of local authority to construct the recovery of forest function in this province, especially for production forest, protected forest, and Provincial Park. This is in line with Act # 34 year of 2004 which is replaced with Act # 24 year of 2014 about Autonomy. Remembering the fact that entrepreneurship is the core of economic growth it is the duty of local authority to stimulate and induce (via regional fiscal policy scenario) so that entrepreneurship is growing rapidly.

Before any of that, it is needed to be considered about ethical choice on partiality towards two party of entrepreneurs: big industrialists or micro, small, and medium enterprise (MSME)? To answer that let us refer to Bakri (2012) whom reports that the welfare of Lampung Province in last three decades is affected mostly by industrialist or by MSME. Big industrialist often leaking the economic added value out of Lampung Province: exploiting resources (land, human, bank credit, and public facility) in Lampung Province, while the benefit flows out of the province. Because of that, the second root of problem is how the regional fiscal expenditure (public expenditure post, apparatus expenditure, and social expenditure) have to allocated so that MSME performance in Lampung Province is stimulated? Besides of that, to ensure the continuity of development in this province, the benefit of provincial income have to distributed fairly to the biggest participant (>70%) in Lampung Province development and working in upstream / agriculture sector. Because of that, the farmers' parity has to be a strategic policy choice for the local authority.

Problem Formulation

The urgent problem that this study aim to solve can be formulated into: [1] It is needed to determine welfare enhancement policy through forest function recovery, development of MSME entrepreneurship, and enhancement of farmers' parity, and [2] It is needed to arrange Lampung Province fiscal expenditure allocation (the portion of public, apparatus, and social expenditure) to stimulate MSME performance and its people welfare.

RESEARCH METHOD

Place and Location of Study

This study consisted of field survey and laboratory work. Beside of satellite image interpretation crosscheck, field survey has been done by several parties of regency/city level and province level, such as Bappeda and BPS. Laboratory work will be taken place in Forest Resource Inventory Lab, Department of Forestry, Faculty of Agriculture, Universitas Lampung. The one cycle time of this study is six months, which will begin from May to October 2016.

Tools and Materials

The materials needed for this study is Landsat satellite image which covers entire Lampung Province, consisted of *path* 123 *row* 063, *path* 123 *row* 064, *path* 124 *row* 063, *path* 124 *row* 064, recorded in 2001, 2008, and 2015. The tools will be used in this study are computer hardware and software, and also stationeries. Hardware that are used are notebook, global positioning system, compass, clinometer, and digital camera. Software that are used are ArcGIS Version 10.1, Erdas Imagine 2014, and Microsoft Office 2013.

Model Postulate, Variables, Necessary data, and the Acquisition Method.

This study uses econometrics modeling approach with ordinary linear model postulate (OLS: Ordinary Least Square) with using seven stage simultaneous equation. All variables applied, necessary data, and acquisition method are summarized in Table 1.

Stages on designing the model

Stages on designing welfare development of Lampung Province in sustainable way is described diagrammatically on Figure 1. The mechanism is explained in detail and chronologically with these following seven stages:

Stage [1] Basic Sector Development

Basic sector is an upstream sector that could trigger multiplier effects for other sectors like industry, trade, and services. In Lampung Province, this sector is included in agriculture sector. Because of that, started with the enhancement of agriculture sector growth from every regency/city [INCOMP_AGR], where this sector's growth have to be based on most diverse ecological characteristics: that is, the usage of land with coverage of forest for each of regency/city. Remembering the performance of people forest is more sustainable because of its clear property right (see Bakri, 2012), so in this study it is needed to differentiate between the role of people forest [HR] and state-owned forest [HN] in enhancing this agriculture sector. In a simple terms, this model is expressed as Equation {1}:

$$[\text{INCOMP_AGR}]_t = \alpha_0 + \alpha_1[\text{HN}]_t + \alpha_2[\text{HR}]_t + \sigma_t$$

Equation {1}

Stage [2]: Enhancement of Industrial Sector Growth in the Economy

To make it sustainable, the economic rent enhancement that will be achieved by agriculture sector [INCOMP_AGR] have to be processed to semi-finished or finished goods, which further will enhance the industrial sector growth [IND_GW]. By doing it this way, the leak of added value to out of the area, or even out of the country can be suppressed. This further leads to labor absorption in industrial sector, while simultaneously stimulate labor transformation in generally saturated agriculture sector (low, even negative marginal productivity) to enter industrial sector so that finally it will suppress the forest encroachment. Note that, in this study, industry is also consisted of services. In simple terms, this model is expressed as Equation {2}:

$$[\text{IND_GW}]_t = \beta_0 + \beta_1[\text{INCOMP_GW}]_t + \mu_t$$

Equation {2}

Stage [3]: Enhancement of Industrial Sector Share in the Economy

The growth of industrial sector [IND_GW] in *Stage II* have to be able to be designed for the enhancement of industrial sector share [IND_SH] in the economic system of that following area's income structure in Lampung Province. Along with that, share of agriculture sector [AGR_SH] have to be declined, yet the total have to increase (as reflected on the *Stage I* above) so that it is not only enough for the consumption but also can supply the raw materials for industrial sector that is designed to increase continuously. This industrial sector share growth have to be identified from other share growth [OTH_SH], such as mining, tourism, and telecommunication sector share. Mathematically, this model is expressed as Equation {3} below:

Table 1. Variables to construct Simultaneous Equation Model (Eq. {1} to {8}), symbols used in model, proxies used in model, data source, data acquisition and extraction procedures

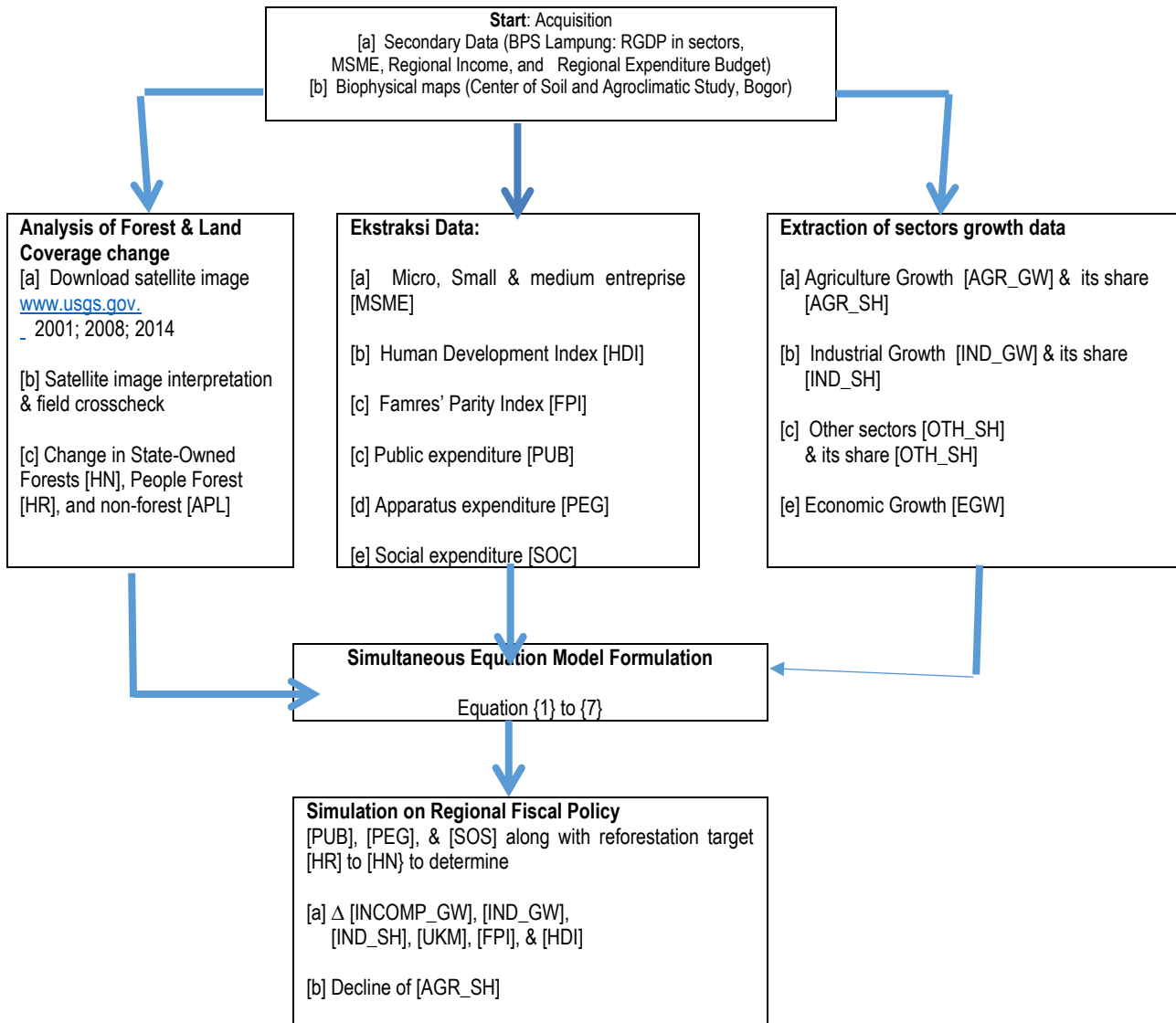
No	Variable	Symbol	Proxy ... towards	Data Source	Acquisition and extraction procedure
1.	Coverage of Forest and non-forest	[HN]= Forested area owned by state [HR] Forested area owned by citizen [APL]= Non-forested area	Area (thousands of Ha) and its proportion towards the area of Lampung Province.	Satellite Image Interpretation (LANDSAT) (www.glovis.usgs.gov) continued by field crosscheck to each differing sightings locations	<ul style="list-style-type: none"> • Landsat ETM+7 of entire Lampung for 2000, 2002, 2006, 2009, and 2013, downloaded • Geometric, radiometric correction, making image mosaic, cropping, etc. • Interpretation with Software ARCHGIS 10.3 • Field crosscheck (only image of 2015) for each regency/city • Correction of image interpretation • Overlay with Forest System Map, and Administrative Maps of Regency/City • Extracting area of [HN], [HR], and [APL] for each Regency/City for 2000, 2007, 2015
2.	Per capita income in agriculture sector	[INCOMP_AGR]	%	RGDP of Regency and City of 2000-2015 (BPS)	<ul style="list-style-type: none"> • Extract RGDP value on agriculture sector • Calculate the % growth of agriculture sector from 2001 to 2015
3.	Industrial Sector Growth	[IND_GW]	%	RGDP of Regency and City of 2000-2015 (BPS)	<ul style="list-style-type: none"> • Extract RGDP value on industrial sector • Calculate % growth of industrial sector from 2001- 2015
4.	Sectoral share	[IND_SH]= Industrial sector share [AGR_SH]= Agriculture sector share [OTH_SH]= Other sectors share	% % %	RGDP of Regency and City of 2000-2015 (BPS)	<ul style="list-style-type: none"> • Extract RGDP contribution data by sector • Create the proportion of each sector for 2011 to 2015 for each regency/city.
5	Entrepreneurship performance	[MSME]	The number of MSME for each 1000 for every regency/city	Data of small industries and MSME for each regency/city for 2000-2014	<ul style="list-style-type: none"> • Extract the number of small industries and MSME for each regency/city from 2000 to 2014 • Divide with the population value and then multiply it with 1000
6.	Regional economic growth	[ECON_GW]	%	RGDP of Regency and City of 2000-2014 (BPS)	<ul style="list-style-type: none"> • Extract real regency/city RGDP for 2001-2005 • Calculate growth for each year for every regency/city
7.	Farmers' parity	[FPI]	Farmers' Exchange Rate	Extract farmers' exchange rate in regency/city from 2000-2014 (BPS)	<ul style="list-style-type: none"> • Extract farmers' exchange rate from 2001 to 2015 • Present it for each regency/city
8.	Welfare level	[HDI]	Human development index	Welfare statistics of regency/city 2000-2014 (BPS)	<ul style="list-style-type: none"> • Extract human development index value from 2001-2015 • Present it for each regency/city
9.	Fiscal Expenditure Allocation of Lampung Province	[PUB] [PEG] [SOS]	Public expenditure (Billion Rp.) Apparatus expenditure (Billion Rp.) Social expenditure (Billion Rp.)	Financial statistics of regency/city from 2000-2014	<ul style="list-style-type: none"> • Extract each and every three types of regional expenditure budget. • Present it for each regency/city

$$[IND_SH]_t = \sigma_0 + \sigma_1[IND_GW]_t + \sigma_2[AGR_SH]_t + \sigma_3[MIN_SH]_t + \xi_t$$

Equation {3}

Stage [4]: Enhancement of Small Industries Entrepreneurship Performance

In designing this kind of public policy leads to the problem in choose the ethic choices: *between the partiality on big industries or in small industries* [MSME] that growth is needed to be stimulated. In this design, the latest group seems to be more just and scientifically based choice to ensure sustainability of an economic system, especially in the developing countries (Hayami and Godo, 2006). As can be inferred in economic growth theory, in endogenic way, a growth of economy can give strong sustainability insurance if it involves broad agents or economy performer participation, so that the benefit of provincial income is well distributed (Romer, 1991 and Lucas 1989, in Krugman, 2010b).



Gambar 1. The Stages of study

In that context in Lampung Province, economic performer is mostly dominated by small farmers, so [INCOMP_AGR] have to be impacted to small industrialist, [MSME], which has significantly bigger population (compared to big industrialists) and has bigger impact on prospering Lampung Province citizen for the last 35 years (Bakri, 2012). Because of that, the increase of industrial sector share [IND-SH] ethically and rationally used to enhance entrepreneurship performance of MSME. Mathematically this model is expressed as Equation {4}.

$$[MSME]_t = \theta_0 + \theta_1[IND_SH]_t + \epsilon_t$$

Equation {4 }

Stage [5]: Controlling a Healthy and Sturdy Economic Growth

As explained in modernization theory (Romer, 1991, and Lucas, 1989 in Krugman, 2010b), the economic growth with sturdy and healthy characteristics can be constructed if the growth came from entrepreneurship performance from inside its own economic system. Because of that the performance [MSME] in Province Lampung have to be its own core of economic growth [EGW] for each regency/city in Lampung Province. In simple terms, this model can be expressed as equation {5} as follows:

$$[ECON_GW]_t = \gamma_0 + \gamma_1[MSME]_t + \varepsilon_t$$

Equation {5}

Equation [6]: Farmers empowerment as the synergy between Agriculture and Small Industries sector

This stage is the dialectics between economy performers that plays the role on the downstream (small industrialists, MSME) and those on the upstream (agriculture sector, including forestry). In this stage, actually, is also an ethical choice: is the economic growth [EGW] is used to increase farmers' parity or other group of people. Both ethically and rationally, in this study, it is needed to design enhancement in farmers' parity, which further farmers' exchange rate is used as proxy [FPI]. Hence, this dialectics can be expressed as equation {6}:

$$[FPI]_t = \lambda_0 + \lambda_1[ECON_GW]_t + \eta_t$$

Equation {6}

Stage [7]: Measuring the Increase in Welfare

The last stage of this study is development of welfare enhancement strategy model [HDI: human development index] through recovery of forest function, strengthening the MSME entrepreneurship performance, and increasing farmers' parity [FPI], simply audited by equation {7}

$$[HDI]_t = \Omega_0 + \Omega_1[FPI]_t + \pi_t$$

Persamaan {7}

Stage [8]: Creating Fiscal Expenditure Device to Stimulate MSME performance

This stage is also ethical choice to take sides on MSME so that they will be developed as the core of economic growth. In this case, the relationship between the role of regional public expenditure [PUB], regional apparatus expenditure [PEG] and social expenditure [SOS] and performance of MSME [MSME] have to be determined. This device is expressed as Equation {8}.

$$[MSME]_t = \sigma_0 + \sigma_1[PUB]_t + \sigma_2[PEG]_t + \sigma_3[SOS]_t + \eta_t$$

Equation {8}

RESULT AND DISCUSSION

Performance of Forest Coverage in Lampung Province as Environmental Service Provider

The interpretation of Landsat Image 2002, 2009, and 2013 that was done by Mustika, Bakri and Wardani (2016) are presented in the map sketch in Figure 2. It is also presented in Table 2, along with interpretation done by Bakri (2012) for Landsat Image of 2000 and 2006.

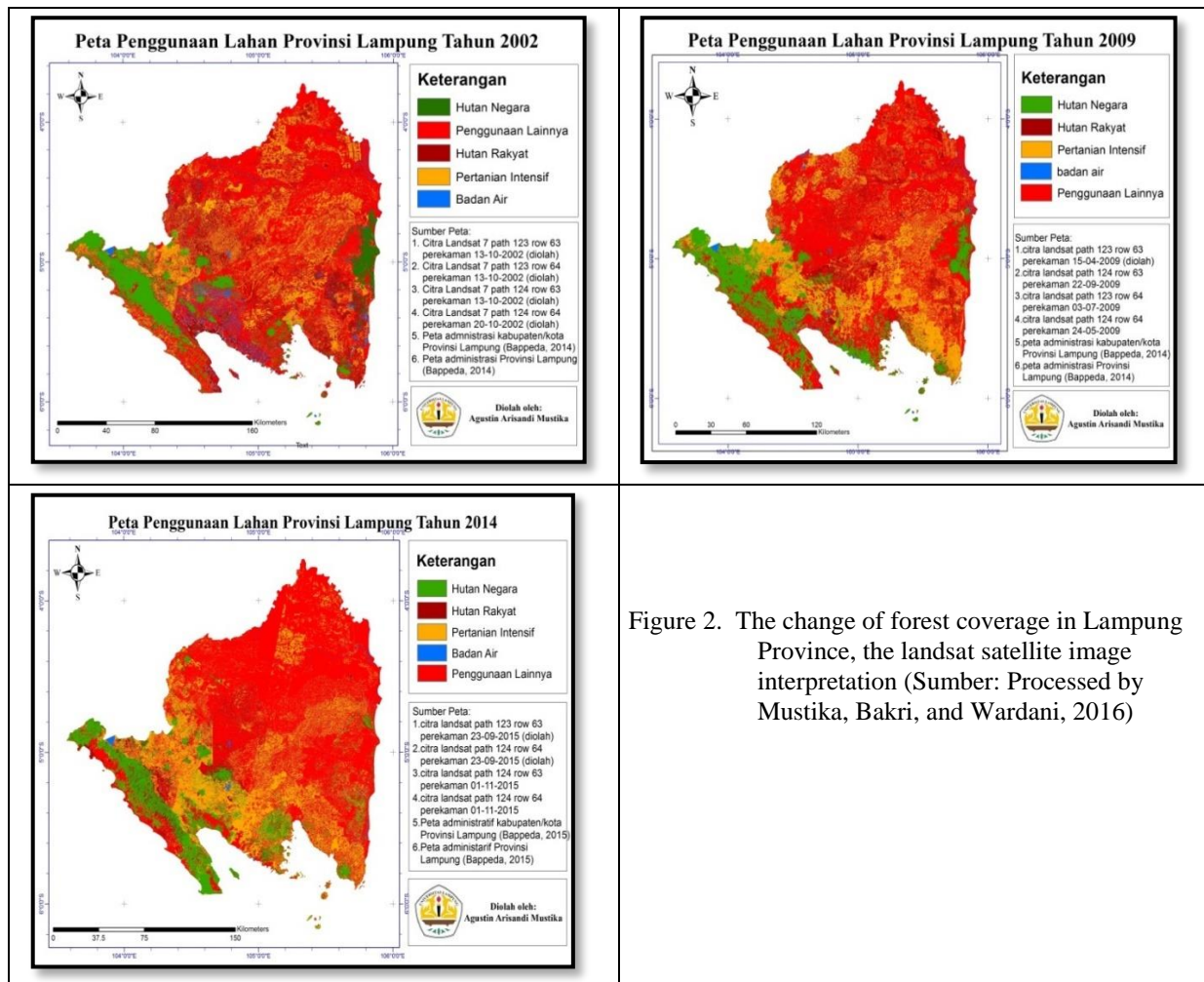


Figure 2. The change of forest coverage in Lampung Province, the landsat satellite image interpretation (Sumber: Processed by Mustika, Bakri, and Wardani, 2016)

As we can see in Table 2, the coverage in people forest [HR] from 2000 to 2006 declined, followed by a slight increase with the average of 2.93 (Sd= 0.07) %. It is also happened to state-owned forest with the average of 11.18 (SD=2.96) %. A slight increase in 2006 is estimated due to the reforestation of 2007, namely Gerakan Reboisasi Nasional Hutan and Lahan (GRNHL). This dynamics on forest coverage seems to be very influential on ecological processes in the region of Lampung Province, which further leads to the whole life process and economy in Lampung Province.

This arguments can be understood because of the existence of environmental service from the forest coverage, including the hydrological control (drinking water source, irrigation, electrical power, etc.); environmental amenity service (oxygen producer and pollutant absorber of CH₄, SO₂, NO₂, CO₂ etc., microclimate, wind protection, flood, and soil fertility) also other important ecological service to sustain ecological equilibrium like cereals pollination by bees, disease vector equilibrium control, etc. These environmental services impacts generated by the forest coverage is important to be quantified to quantitative measures on economic benefits or other welfare factors. By doing so, the

function of the forest that becomes the base of all of the spectra of people's welfare can be shown, even so all this time the function is not well appreciated by techno-centric economists.

Table 2. The development of forest coverage in people [HR] and state-owned [HN] forests in Lampung Province from 2000-2003

Year of satellite image	People forest coverage [HR]		State-owned forest coverage [HN]		Total forest coverage in Lampung Province	
	Ha	%	Ha	%	Ha	%
2000*	9,833,159.2	2.84	40,094,360.4	11.58	49,927,519.6	14.42
2003	9,971,654.4	2.88	39,990,489.0	11.55	49,962,143.4	14.43
2006*	10,144,773.4	2.93	20,739,656.2	5.99	30,884,429.6	8.92
2009	10,421,763.8	3.01	20,705,032.4	5.98	31,126,796.2	8.99
2013	10,283,268.6	2.97	21,362,884.6	6.17	31,646,153.2	9.14
Average=	10,130,923.9	2.93	28,578,484.5	8.25	38,709,408.4	11.18
Sd=	235,594.5	0.07	10,468,435.9	3.02	10,260,189.3	2.96

Source: Interpretation of satellite image (Mustika, Bakri, dan Wardani, 2016); * Bakri (2012)

Social-Demographic Performance and Economy in Lampung Province

Population growth and total income (total RGDP, RGDP on agriculture sector [RGDP_AGR], RGDP on industrial sector, RGDP on mining and mineral sector, and 8 other sectors [RGDP_OTH] from 2001 to 2015 is presented on Table 3.

From Table 3, we can see that agriculture sector is the biggest contributor compared to industrial sector [RGDP_AGR], and mineral-mining sector [RGDP_MIN], and other 8 sectors [RGDP_OTH]. This fact states clearly that Lampung is an agrarian region, which need to be developed so it can transform to modern sector based on industry and services. In Table 3, it is also presented those sectors share, along with the economic growth and industrial sector growth, and also identifying variable on the strength of transition from agrarian to industrial region: the density of MSME per 10 thousands population, and also welfare indicator [HDI] and deciding variable of justice ethics on the easy on development access: [FPI].

As can be observed in Table 3, the agriculture sector share [AGR_SH] in the economy of Lampung Province is still the dominant share of welfare contributor with the average of 39.68 (Sd=4.36)%. Nevertheless, there is a tendency of decline for this share, along with the increase in industrial sector growth [IND_GW] and economic growth. These facts also the indicator on how well economic structure transformation from agrarian to industrial. Additionally, in Table 3, it is also shown that the growth of [MSME] is a deciding factor on the success of the mentioned transformation.

For the growth and share of economy performance, performance of [MSME], [FPI], and human development index in Lampung Province from 2001-2005 is presented in Table 4. As can be observed in Table 3 and Table 4, it can be understood that qualitatively there is a same tendency from year to year on the increase of those variables. Yet this qualitative analysis cannot be used to conclude the cause and effect relation in a valid way. Also note that [FPI] is not always increasing, in fact it is fluctuating and can press the resiliency of farmers, the most dominant development actor. This is the same with human development index (very reliable development achievement index) seems sluggish on the growth. Because of that, the analysis of inter-variable relation have to be done deeply so it can be used as the frame to accelerate a just welfare. For that, in this part it is elaborated the result from a simultaneous test on the relation from

growth of forest coverage performance towards the farmers' income per capita, and furthermore with industrial sector share, economic growth, farmers' parity, and finally with human development index.

Models of Welfare Deciding Variables Simultaneous Relationship

The effort on welfare development in this region has been developed to seven stages model is discussed in detail:

Forest function on the foundation of welfare

The relation between farmers' income per capita [INCOMP_AGR] with ecological function of people forest [HR] and state-owned forest [HN] can be expressed as Equation {9}:

$$[\text{INCOMP_AGR}]_t = -19.5^{**} + 9.26^{**}[\text{HR}]_{t-2} - 0.0447[\text{HN}]_{t-2}$$

$$P\text{-value} = 0.012 \quad R\text{-Sq}(\text{adj}) = 97.6\%; * \text{ apparent in level } 10\%$$

Equation {9}

Table 3. The development of population and gross domestic product in Lampung Province on 2001-2015

Year	Population	Total RGDP	RGDP_AGR (Agriculture)	RGDP_IND (Industry)	RGDP_MIN (Mining and Mineral)	RGDP_OTH (Others)	[INCOMP_AGR] (Agric. Per capita Income)
	People		Million Rupiahs				
2001	6,722,314	94,886,354.7	42,271,871	12,923,522	2,410,113	37,280,849	8.983
2002	6,787,654	100,313,854.2	42,874,141	13,542,370	4,132,931	39,764,412	9.024
2003	6,852,999	105,289,421.4	44,305,789	13,982,435	4,453,743	42,536,926	9.236
2004	6,915,950	109,553,642.9	46,330,236	14,493,947	3,965,842	44,763,619	9.570
2005	7,172,831	114,812,217.8	48,852,599	15,212,619	3,501,773	47,245,228	9.730
2006	7,260,588	121,861,688.0	52,059,313	16,073,557	3,363,383	50,353,249	10.243
2007	7,348,788	128,771,245.7	54,805,042	17,049,313	3,245,035	53,671,855	10.654
2008	7,437,414	136,072,575.3	56,810,300	18,138,474	3,224,920	57,912,488	10.912
2009	7,526,448	143,815,104.8	58,388,933	19,406,024	2,935,032	65,969,568	11.083
2010	7,608,405	152,055,710.3	62,327,404	21,714,382	2,989,592	68,013,925	11.703
2011	7,691,007	161,179,053.0	65,845,668	22,878,180	3,126,277	72,455,204	12.231
2012	7,777,915	170,769,206.6	57,737,069	29,677,129	10,303,929	73,790,676	10.605
2013	7,865,806	180,620,007.7	59,893,595	31,973,935	11,485,799	77,523,786	10.878
2014	8,026,191	189,789,999.5	62,061,330	33,414,825	11,592,409	83,105,743	11.046
2015	8,117,268	199,525,419.8	63,568,799	35,912,939	12,079,303	87,600,477	11.188
Average=	7,407,439	140,621,033	54,542,139	21,092,910	5,520,672	60,132,534	10.47
Sd=	451,384	33,878,648	7,940,454	7,895,176	3,698,504	16,497,937	0.98

Source: Various BPS (2000-2016 processed from various release years www.bps.go.id)

The information contained in the above mathematical expression is to increase the farmers' income per capita [INCOMP_AGR] the forest function have to be rehabilitated two years before. The rehabilitation have to be focused in the people forest areas [HR]. This choice of policy is very rational and just because this study found that only the people forest that can increase the farmers' income per capita, not the state-owned forest, contrariwise. If a reforestation is done on approximately 1% of Lampung Province area, the following two years the income of farmers will increase by Rp. 9.3 million per capita per year.

Table 4. Share and growth of economy sectors, MSME performance, farmers' exchange rate [FPI] and human development index from 2011 to 2015

Year	Share of Agriculture Sector [AGR_SH]	Share of Industrial Sector [IND_SH]	Share of Mining- Mineral Sector [MIN_SH]	Other sectors share [OTH_SH]	Industrial Growth [IND_GW]	Economic growth [ECON_GW]	[MSME]	[FPI]	[HDI]
Percent							Unit/10 thousand populations		
2001	44.55	13.62	2.54	39.29	-	3.70	99.70	79.9	-
2002	42.74	13.50	4.12	39.64	4.79	5.72	109.26	76.2	57.48
2003	42.08	13.28	4.23	40.40	3.25	4.96	120.43	73.6	58.53
2004	42.29	13.23	3.62	40.86	3.66	4.05	122.26	100.6	59.26
2005	42.55	13.25	3.05	41.15	4.96	4.80	120.93	106.8	61.54
2006	42.72	13.19	2.76	41.32	5.66	6.14	122.02	105.6	62.01
2007	42.56	13.24	2.52	41.68	6.07	5.67	120.75	107.9	62.68
2008	41.75	13.33	2.37	42.56	6.39	5.67	120.02	104.2	63.14
2009	40.60	13.49	2.04	45.87	6.99	5.69	111.04	108.0	63.71
2010	40.99	14.28	1.97	44.73	11.90	5.73	125.02	115.0	64.20
2011	40.85	14.19	1.94	44.95	5.36	6.00	159.31	121.5	63.71
2012	33.81	17.38	6.03	43.21	29.72	5.95	163.44	125.4	64.20
2013	33.16	17.70	6.36	42.92	7.74	6.23	180.68	124.5	65.73
2014	32.70	17.61	6.11	43.79	4.51	5.51	199.01	104.2	66.42
2015	31.86	18.00	6.05	43.90	7.48	5.05	233.03	103.2	66.95
Average =	39.68	14.62	3.71	42.42	7.75	5.39	140.46	103.77	62.83
Sd=	4.36	1.94	1.67	2.00	6.68	0.74	38.26	16.12	2.85

Source: BPS (2000-2016 processed from various year release and www.bps.go.id)

This findings is also proving that the [HR] can increase the farmers' income, which further leads to increase on industrial group citizen or others in Lampung Province. Regarding this, the role of increase on farmers' income towards industrial sector growth need to be elaborated, as follows:

Growth of Industrial Sector is determined by Farmers' Income

Since the fact that the biggest participant of development in Lampung Province are farmers, it is very relevant to see that the farmers' income is the thing that stimulates demand towards industrial goods and also the services. The relation

between [INCOMP_AGR] to the industrial sector growth [IND_GW] as the function of [INCOMP_AGR] can be expressed as Equation {10}:

$$[\text{IND_GW}]_t = -37.8^{**} + 4.37^{**}[\text{INCOMP_AGR}]_{t-1}$$

$$P\text{-value}=0.011; R\text{-Sq}(\text{adj}) = 38.0\%; **\text{significant at level of } 5\%$$

Equation {10}

This relation shows that if the farmers' income per capita increased on average of Rp. 1 million per year, the industrial sector, in average, will grow with the value of 4.37%, on the following year. Because of that, the increase on farmers' income per capita can become the key of an agrarian region to do economic structure transformation to a modern industry region.

The increase of industrial sector share as the form of economic structure transformation

Performance of economic structure transformation (that facilitates educated labor in agriculture sector) towards an industrial and service economic structure have to be realized as the increase on industrial sector share and the decline of agriculture share in significant way, even if the total production aggregate from agriculture sector have to be continuously increased. If possible, this process have to be accompanied by the decline in other sectors resource exploitation share, such as mining and mineral sector share [MIN_SH]. This phenomenon is shown by Equation {11}, as follows:

$$[\text{IND_SH}]_t = 27.1^{***} + 0.115^{***}[\text{IND_GW}]_t - 0.359^{***}[\text{AGR_SH}]_t + 0.258^{**}[\text{MIN_SH}]_t$$

$$P\text{-value}=0.000; R\text{-Sq}(\text{adj})=99.6\%; **\text{apparent on level of } 5\%; ***\text{significantly apparent on level of } 1\%.$$

Equation {11}

This findings shows that in Lampung Province, the design can be healthily constructed: with the average economic growth of 1%, the share on industrial sector [IND_SH] can be increased by 0.12%, and also can absorb labor from agriculture sector by approximately 0.36%. Note that [IND_SH] can also be increased by 0.26% if mining and mineral sector share [MIN_SH] is increased by average of 1%.

The increase on Industrial Sector share can be utilized as the stimulus of MSME growth

An industrial sector growth in an economic region can be utilized as the stimulus of MSME growth. Bakri (2012) proves that his research on 1996-2010 concludes that the micro-middle entrepreneurs is the most contributing agent on the growth of welfare in Lampung Province. Meanwhile, the big entrepreneurs or industrialists tend to lower it down. In this research it is also found that if the industrial sector share in the year [IND_SH]_t is increased by 1%, it will significantly stimulate the density of MSME in the following year by 20 units per 10 thousands population. This findings can be expressed as Equation {12}:

$$[\text{MSME}]_t = -144^{***} + 20.0^{***}[\text{IND_SH}]_{t-1}$$

$$P\text{-value}=0.000; R\text{-Sq}(\text{adj})=84.6\%; ***\text{very signifant at level of } 1\%$$

Equation {12}

The growth of economy can be triggered by MSME

As a sturdy economy agent/performer, additionally, MSME can be the trigger to the growth of economy in a transforming industrial economy structure region. Micro to middle-sized entrepreneurs are a relatively elastic group of enterprise to local, domestic or global economic shock, including the effects local rent seekers (such as hoodlums, illegal charges, etc.), the shock due to fuel price policy, other subsidy (national shock), and also interest and exchange rate (global shock). Because of that, this group is a party that is ready to absorb labor that experience marginal productivity in the rural area, which is usually identic with agriculture sector, and also can widen the chance of working and big participation in microeconomic activities. Also because of that, this group is the pivot of economic growth in Lampung Province. This arguments can be strengthened by this research, that if MSME increased by 1 unit per 10 thousand populations, the

regional economy growth [ECON_GW] will be increased by approximately 0.014% for the next two years. This expression can be written as Equation {13}:

$$[ECON_GW]_t = 3.27 + 0.0139*[MSME]_{t-2}$$

$$P\text{-value}=0.000R\text{-Sq}(\text{adj})=26.2\%; \quad * \text{significant at Level of } 5\%$$

Equation{13}

Economic Growth should be intended firstly for enhancing the farmer's welfare: An ethical problem choice

The next problem was which choice should be ethically elegant intended. The answer was to enhance the farmer parity index [FPI]. The robust argument was since the farmers were the largest participant in economic activities in Lampung Province. They composted more than 70% of population but they are still the weakest in accessing to the benefit of economics growth besides. In addition, if their parity could be enhanced, they could accelerate the multiplier effect of the economics activities through their demand on the secondary, even tertiary of industrial goods and then would improve the industrial income community and at the climax would much more enhance the performance of the entrepreneurial growth. The climax is the strongest indicator for economic development process in almost of around hemisphere.

We found that the last year economic growth, [ECON_GW]_{t-1}, could be designed the farmers' parity index in current year, [FPI]_t, that could be expressed in Equation {14} the following.

$$[FP]_t = 48.6^{**} + 10.5^{**}[ECON_GW]_{t-1}$$

$$P\text{-value}=0.035; R\text{-Sq}(\text{adj}) = 29.2\%; \quad ** \text{significant at } 5\% \text{ level.}$$

Equation {14}

Farmer's Parity: A key for the enhance of welfare for all people

Farmer's parity is the biggest participant in the Province Lampung economy and further have to be the ace to enhance welfare of people as a whole. In this study it is proven that if the farmers' parity in the prior year [FPI]_{t-1} increased by 1 unit, the welfare of population in Province Lampung as a whole, in average, will be increased by 0.147 [HDI] units the following year. This expression is presented in the following Equation {15}:

$$[HDI]_t = 47.5^{***} + 0.147^{***} [FPI]_{t-1}$$

$$P\text{-value}=0.000; R\text{-Sq}(\text{adj})=72.4\% \quad *** \text{ significant at } 1\% \text{ level.}$$

Equation {15}

Regional Fiscal Policy can be used as the device to grow MSME

The scheme of effort to enhance the welfare in Lampung Province is also dependent to the behavior of local public authority, especially in taking fiscal policy in Lampung Province. In this case, the realized fiscal behaviors are evaluated, especially considering investment on public [PUB], apparatus expenditure [PEG], and social expenditure [SOS].

In this study it is found that if the social expenditure allocated in the next two years, or [SOS]_{t+2}, with the value of Rp. 1 billion/10 thousand population, it will stimulate the growth of [MSME]_t in this year by 0.76 per 10 thousand of population. But, for public investment, even if it is move forward by two previous years, gives the negative impact of 0.22 units per 10 thousand populations. Even more, the increase in apparatus

expenditure of Rp 1 billion per 10 thousand populations is not apparently affecting to the growth of $[MSME]_t$. This expression can be shown by Equation {16}.

$$[MSME]_t = 92.8 - 0.261 [PEG]_t - 0.511*[PUB]_{t-2} + 0.761*[SOS]_{t+2}$$

$$P\text{-value } 0.066 R\text{-Sq (adj)} = 76.4\%; \quad * \text{significant at level of } 10\%$$

Equation {16}

To summarize, it is necessary for fiscal policy function to be directed to social incentives, when MSME grows, and being planned 2 years before the incentive $[SOS]_{t-2}$ or after MSME becomes productive. The form of incentive can be technical and management training, credit interest incentive, etc. If not, the survival strength of them will decline and cannot be well developed.

CONCLUSION AND SUGGESTION

The important conclusion could be made: [1] People forest has contribute substantially as the main upstream for the enhancement of welfare through farmers' income, for 1% reforestation of Lampung Province area, the income per capita of farmers $[INCOMP_AGR]$ will increase for Rp. 9.26 million per year; furthermore followed accordingly, [2] every increase of $[INCOMP_AGR]_{t-1}$ on average of Rp 1 million the previous year, the industrial sector growth will grow approximately 4.37%; [3] Every 1% increase on $[IND_GW]$ will be accompanied with increase on industrial sector share for 0.12% and decline of agriculture sector $[AGR_SH]_t$ for 0.359% and also increase of mining and mineral sector $[MIN_SH]_t$ by 0.258%; [4] Every increase of industrial sector share $[IND_SH]$ the prior year for 1% will stimulate the growth of MSME in average of 20 units per 10 thousands population in the present year; [5] for every MSME growth in average of 1 unit per 10 thousands population for the upcoming two years will boost up economic growth $[ECON_GW]$ for about 0.013%; [6] if $[ECON_GW]$ increased by 1%, the farmers' parity on the following year $[FPI]_{t-1}$ will be increased by 10.5 units; [7] Finally if human development index this year increased by 0.147 units, if the previous year there is an increase of $[FPI]_{t-1}$ for about 1 unit; and [8] beside of that, to stimulate the growth of MSME, Lampung Province government can use social expenditure for the upcoming two years, that is when MSME is established $[SOS]_{t+2}$ through incentive such as trainings, credit supports, and other kind of rewards. Based on the result of this study, at least there are two recommendation that can be given, that is: [1] A study integrating fiscal impact on regency/city is needed, and [2] a research on regency and city level in Lampung Province along with rural budget integration is needed.

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