Working out a technology push by using hybrid franchising

An exploratory research of the MBD project in Central-Kalimantan, Indonesia

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Executive Summary

This study is part of the Local Economic Resource Development (LERD) program which investigates the possibilities of implementing renewable energy in the form of Mobile Bio Diesel in Central-Kalimantan, Indonesia. This study used insights from an existing model on regional economic development and theoretical considerations concerning technology (push), franchising, entrepreneurship and local economic development to develop the main theoretical argument of this thesis which stated that technology push should be carried out by a franchising model to stimulate entrepreneurship and with that local economic development (fig 2). Two models were developed to empirically examine the main theoretical argument and empirically examine the feasibility of introducing a technology push carried out by a franchising model (commercial or social franchising) in remote locations (Capital of Central Kalimantan: Palangkaraya, remote locations: Taruna Jaya, Pilang, Jabirin and Buntoi) in Central-Kalimantan, Indonesia. The results of this study indicate that the smallholder rubber farmers (community level) and the head of villages, head of district and the government departments (low, middle and high institutional level) support a technology push and are willing to participate. Additionally, the results of this study point to a high feasibility of introducing a technology push by a franchising model since all the levels of analysis support it and would like to participate. Furthermore it can be stated that almost all levels prefer a franchising model to introduce a technology push with social franchising elements opposed to a business model which solely focuses on generating profit. Next to this, empirical evidence confirmed the main theoretical argument of this thesis: a technology push carried out by a franchising model can stimulate entrepreneurship in remote villages. Based on both theoretical (both commercial and social franchising) and empirical insights (mainly social franchising), this study concluded that in order to stimulate entrepreneurship in local communities and with that local economic development, a hybrid franchising (a combination of both commercial and social franchising) model should be used to carry a technology push. Furthermore this study recommended the usage of a practical hybrid franchising model to practically introduce the technology push in the remote local villages.

Keywords: *local economic development, technology push, commercial and social franchising, entrepreneurship, energy, bio diesel, Indonesia, Kalimantan, development*

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Fourth, concerning the data gathering process I would like to thank all the head of villages, head of district, government officials of Palangkaraya, and all the smallholder rubber farmers for their insights and their contributions to this study. A smile pops up on my face when I remember the kindness and warm welcome received by all these people when I met them and discussed the MBD project. Next to this a special thanks for the people at CIMTROP for arranging the translator and helping me to find the right remote locations to visit, in particular pak Kitso and Sam. Furthermore, I would like to thank Yayat Budianto for showing me around and discussing the MBD project while occasionally enjoying a drink at Green leaf in Palangkaraya.

Finally, thanks to all my great friends and family who supported me during the process of writing a thesis. Special thanks to my dad for proofreading my thesis and providing me with useful comments and suggestions.

"A man should look for what is, and not for what he thinks should be" (Albert Einstein)

Jan Fredriks, Best, 2012

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Glossary of Acronyms

LED	Local Economic Development
MBD	Mobile Bio Diesel
ITB	Institut Teknologi Bandung
LERD	Local Economic Resource Development

PPO	Pure Plant Oil
EMRP	Ex Mega Rice Project
DESDM	Department of energy and mineral resources
RED	Regional Economic Development
REM	Resource endowments and market conditions
WHO	World Health Organisation
NGO	Non Governmental Organisation
PM2L	Program of development and maintenance of the village

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1. Introduction

The introduction is divided into four sections; the first part will establish the immediate cause for writing this study. The second part of the introduction will provide a background of both the MBD project and the bio industry in Indonesia. Part three will describe the main problem of this study and the last part will provide the main sub-questions and an explanation for using them.

1.1 immediate cause and relevance:

Observation Taruna Jaya

"If lucky, the smallholder rubber farmer will be able to visit the rubber plantation 3 or 4 times a week to clean, tap the rubber and throw away rubber nuts (regarded as waste products)…. As a result one can earn between three to five euro's a day, which is barely enough to make a living and support his or her family. A large amount of the smallholder rubber farmer's income goes directly to the purchasing of gasoline or diesel for either operating their boat or generator in order to have electricity for at least some hours a day. Unfortunately diesel, gasoline and kerosene are not always available in sufficient quantities and as a result the prices fluctuate heavily.

This situation holds for the villages with smallholder rubber farmers which are luckily enough to live relatively close to the main roads, many remote villages such as for example Taruna Jaya (Central-Kalimantan, Indonesia) are not so lucky and are as a result not connected to the energy grids at all. Not having sufficient access to energy and a low level of income pose severe challenges for the people living in these rural communities to survive and live a comfortable life…" (Field research Taruna Jaya, 2012)

The challenges faced by the smallholder rubber farmers in Taruna Jaya (Central-Kalimantan, Indonesia) also apply to the majority of the Indonesian Islands' population which according to a report of Hivos (2010) suffer from overall poverty and not having sufficient access to electricity. Furthermore, many Indonesian rural communities remain reliant on wood for fuel in order to meet other energy needs (Hivos, 2010). The example of Taruna Jaya and the report from Hivos indicate that throughout Indonesia poverty and access to energy remain major

socio economic problems. It is widely accepted that access to modern energy sources is vital for sustainable development and poverty reduction (Kiplagat, Wany & Li, 2011; Reddy, 2008). The Mobile Bio-Diesel (MBD) project carried out by three Dutch universities (including the University of Groningen) and three Indonesian universities is an example of a project which aims to create sustainable development and poverty reduction in remote areas in developing countries. Additional goals of the MBD project are the prevention of a further degradation of the environment and in particular that of sensitive peat lands, reducing the probability of forest fires, stimulating the transition of Indonesia into a bio based economy, and reducing the dependency of Indonesia on fossil resources like crude oil (NW0, 2012). The universities together provide the local communities in the area of Central-Kalimantan with a so-called technology push. The Mobile Bio-Diesel project consists of multiple programs including a program concerning local economic resource development (LERD), which focuses on the establishment of a framework and actual plan for all the stakeholders involved in introducing this new technology push to the local communities in Central-Kalimantan. This study is part of the MBD project and the LERD program and focuses on examining the feasibility of introducing the technology push by a franchising model (commercial or social franchising) to stimulate entrepreneurship and with that local economic development in remote villages in developing countries. A major reason for focusing on the feasibility of introducing the technology push (MBD project) can be found in the fact that many people of the research group of the MBD project (Interview 2012) believed that the main problem concerning the MBD project would lie in smallholder rubber farmers and institutions in Central-Kalimantan who were not willing to participate. This perspective was primarily based on previous studies of Baars (2010) and van Kammen (2010) focusing on local economic development in Central-Kalimantan who found a resistance to change by the local people living in the remote villages.

The findings of this study contribute to both the Mobile Bio Diesel project and the academic literature. Concerning the MBD project it can be stated that insights will be offered regarding the feasibility of introducing the technology push in the locations of the Ex-Mega-Rice-Project area. The gathered insights will resemble the perspectives taken by different institutional levels in Central-Kalimantan and the key stakeholders: the smallholder rubber farmers. This study will in addition contribute by recommending a practical model to carry out a franchising model in remote areas which will be of high relevance for the MBD project (see recommendation 6.1). The findings of this study furthermore contribute to academic

literature by providing theoretical and empirical evidence which indicates that a technology push should be introduced by a franchising model to stimulate entrepreneurship and with that local economic development in developing countries (fig 2 & 6)

1.2 Background: MBD project and Indonesian bio diesel industry

MBD Project

The Mobile-Bio-Diesel project is developing a new technology, the mobile processing unit. The technology used in the mobile processing unit is able to process Pure Plant Oil (PPO), which stems from an agricultural crop, into bio-diesel (Baars, 2010). This biodiesel can be efficiently produced on a small scale and could as a result be applied on the mobile production unit. Since the mobile processing unit is mobile, it is expected to cope with the current challenge faced by fossil diesel refineries which focuses on the disadvantage of high transportation costs of fossil fuels (van Niel, 2010). Since rubber nuts as an agricultural crop have a high potential for the creation of biodiesel, it serves as no surprise that the localities focusing on the rubber industry in the area of the Ex-Mega-Rice-Project (Central-Kalimantan) are considered to be highly relevant for the Mobile-Bio-Diesel project (de Windt, 2011). It is for this reason that one of the key stakeholders of the MBD project can be found in the smallholder rubber farmers living in the remote localities in Central-Kalimantan. The MBD project could thus add value to the rubber nuts and create access to sustainable energy in the remote villages in Central-Kalimantan (Field research, 2012).

Bio diesel in Indonesia

Currently, Indonesia is very much dependent on fossil fuel for its energy source and the non fossil alternative - renewable energy - has not yet been fully explored and utilized. Data of fossil energy reserves from the Department of Energy and Mineral Resources (DESDM, 2005) show that the proven reserve of oil in Indonesia is approximately 9 billion barrels and with an average production rate of 500 million barrels a year, the reserve will be exhausted in 18 years (Tambunan & Wirawan, 2006).

In order to satisfy the domestic energy consumption, Indonesia has to import crude oil and finished petroleum products such as diesel fuel and gasoline. As a result it can be argued that Indonesia becomes in the near future very much dependent on overseas oil supply to fulfil the constant increasing demand (Tambunan & Wirawan, 2006). In order to decrease this

dependency on fossil fuels it serves as no surprise that developing alternative renewable energy sources such as biofuel is a must for the government of Indonesia. Among the top reasons the government of Indonesia gave for promoting the development of biofuels were next to energy security the development of new export opportunities, job creation (especially in rural areas) and building on the existing strengths in the agricultural sectors. That the government of Indonesia wants to stimulate the development of alternative energy sources is also evidenced by the enactment of a new energy policy in 2006 which aimed at partially shifting the use of fossil fuel into renewable energy sources, including biofuel. An indication of the government's commitment is also provided by the allocation of 10 million hectares of land to the production of biofuel crops (Jupesta, Parayil & Harayama, 2011).

Unfortunately, till now, biofuel did not yet achieve the set policy targets. The main reasons being; higher cost of production relative to fossil fuel, unwillingness from industries due to uncertain markets, distribution barriers due to geographical constraints and a relative low support from local government (Jupesta et al, 2011). The above mentioned MBD project could possibly alleviate the problems faced, by providing multiple rural communities in the area of Palangkaraya with mobile biofuel.

1.3 Research Design

Problem description

The development literature provides interesting points of departure for approaching projects like the MBD project which aim at the creation of sustainable development and poverty reduction in developing countries. Two perspectives are rather dominant in the development literature which either focus on huge one-size-fits-all investment approaches (Rostow, 1960; Sachs, 2005) or concentrate on situation specific structural approaches to improve the standards of living of people in developing areas of the world (Kahn, 1979, Easterly, 2002, 2006). By focusing on small-scale mobile production of bio-diesel it can be argued that the MBD project leans towards a situation specific approach. The scholar Stimson (2009) took a situation specific structural approach when developing a model which aimed at explaining sustainable local economic development. Although highly relevant, this model does neglect some crucial factors which could stimulate sustainable local economic development. This study believes that technology (push) is an important factor to be included in the process of

reaching sustainable local economic development. Especially the ownership of this technology in remote localities is of vital importance for sustainable development. This is illustrated by the argument by Cooper (1972) and Clark (1975) who specifically place the blame for the persistence of underdevelopment in developing countries on the fact that production technology is owned by large enterprises. Large corporations, in this view, may make decisions concerning the adoption of technology which are rational with respect to the firm, but which are clearly not optimal for developing countries. Since this MBD project wants to introduce a new technology (push) in the remote villages of Central-Kalimantan and with that stimulate development, it is necessary to consider types of ownership which could stimulate the development of these rural communities. Given this, the main research question of this study will focus on the following:

What kind of ownership variety (commercial or social franchising) would be best in introducing a technology push to stimulate entrepreneurship and with that local economic development in remote areas in developing countries?

Sub-research questions

The main research question of this study will be properly answered by discussing the following related sub-questions:

1. *What does the literature say about the linkages between technology push, franchising, entrepreneurship and local economic development?*

This sub-question is essential to ask since it will provide insights with regard to the theory relating to technology push, franchising (commercial and social franchising), entrepreneurship and local economic development and their theoretical relation with one another.

2. *What does the literature say about social and commercial franchising and what is the theoretical difference between the two franchising approaches?*

The second sub-question will provide the necessary literature concerning both commercial and social franchising and will elaborate upon theoretical linkages between franchising and local economic development. Next to this it is vital to gain an understanding of the differences between either social or commercial franchising since this concerns the main research question of this study.

3 *Are the smallholder rubber farmers (community level) and the institutions (institutional level) ready for a technology push carried out by a franchising model and do both levels support the MBD project?*

The third sub-question is important to ask since it will provide insights from the main stakeholders regarding the feasibility of implementing a technology push in the remote villages.

4 *Which ownership variety: commercial or social franchising received the most empirical support by both community and institutional level?*

The fourth sub-question is a logical next step in the process since it will provide the necessary insights regarding the level of support for either commercial or social franchising.

5 *Do the empirical findings (table 4) on both community level (smallholder rubber farmers) and institutional level support the main theoretical argument that a technology push carried out by a franchising model stimulates entrepreneurship?*

The fifth and last sub-question is essential to ask in order to be able to validate the statement regarding a technology push carried out by a franchising model which could stimulate entrepreneurship and with that local economic development.

1.4 Thesis Overview

This thesis will commence with chapter 2 which provides an overview of the literature concerning local economic development, technology push, franchising and entrepreneurship. The research methodology of this research will be introduced in chapter 3. This chapter will introduce two models which serve as a tool to examine whether the main theoretical argument of this thesis holds and examine the feasibility of introducing a technology push. Additionally, chapter 3 will provide the strategy for approaching this research in an empirical setting, socio economic profiles of the remote locations and measures used to assess the models in a empirical setting. Chapter 4 will discuss the results of this study focusing on technology push, franchising, entrepreneurship and multiple levels of analysis. Chapter 5 will provide a discussion focusing on discussing the results and discussing the research questions used in this study. Finally, chapter 6 will provide the conclusion of this study and will additionally provide a recommendation in the form of a practical hybrid franchising model, implications and the limitations of this study.

2. Literature review

This literature review will provide insights with regard to past and current perspectives concerning local economic development (LED) and variables influencing LED. The literature review will commence with introducing local economic development and a highly relevant model on the topic of LED by Stimson (2009). Secondly, the model of Stimson (2009) will be analyzed and a new factor (technology push) and intervening variable (franchising) influencing entrepreneurship and with that local economic development will be introduced and further elaborated upon. The following theoretical question will function as a guide throughout this literature review: *What kind of ownership variety (commercial or social franchising) would be best in introducing a technology push to stimulate entrepreneurship and with that local economic development in remote areas in developing countries and how do the factors technology push, franchising and entrepreneurship relate to local economic development?)*

"We must become the change we want to see"
Mahatma Gandhi

2.1 Local economic development

Before providing insights to local economic development it is of vital importance to clearly define the main topic of this thesis: achieving sustainable local economic development. The scholars in this field Stimson, Stough and Roberts (2006) proposed the following definition "Regional economic development is the application of economic processes and resources available to a region that result in the sustainable development of, and desired economic outcomes for a region and meet the values and expectations of business, of residents and of visitors (p.6)." Additionally it can be stated that the long term objective of regional economic development (RED) is to internalize a process which will ensure a competitive and entrepreneurial city or region and one that achieves sustainable local economic development (Stimson, Stough & Salazar, 2005). This thesis will, when referring to local economic development, focus on this definition by Stimson, Stough and Roberts (2006).

Generally the literature concerning local economic development is divided between scholars and policy makers who mainly focus on huge one-size-fits-all investment approaches (Rostow, 1960; Sachs, 2005) and theorists and practitioners who try to approach local

economic development from a different angle; by focusing more on situation specific structural approaches which can improve the standards of living of people in the rural and developing areas of the world (Kahn, 1979, Easterly, 2002, 2006). The combined effort focusing on a situation specific structural approach to local/ regional economic development by Stimson, Robson, Stough and Salazar (2003) and Stimson, Stough and Salazar (2003; 2005) have resulted in a series of papers which proposed a new model framework for regional economic development. As stated by Stimson, Stough and Roberts (2006): "because of the changing role of regional economies within nations and the impacts of globalization, and given the context of contemporary concerns about how to achieve sustainable development, a set of new considerations is thus now being taken into account in formulating and implementing economic development strategies for regions." The next section will elaborate more upon this new model framework since it will serve as a point of departure for this study's main theoretical argument to stimulate local economic development.

2.2. Stimson's (2009) Model of Regional economic development

This section will briefly introduce and explain the model framework proposed by Stimson (2009) concerning the sustainable development of a competitive and entrepreneurial city or region.

According to Stimson and Stough (2008) it can be stated that over the past two decades the literature concerning local and regional economic development has shifted from an emphasis on exogenous (external) factors to an emerging emphasis on endogenous (internal) factors influencing regional economic development. The traditional regional economic development approaches and models were based on neo-classical economic growth theory; mostly based on the work of Solow (1956, 2000) and the 'Solow growth model.' The latest approaches with regard to regional economic development although recognizing that development is framed by the exogenous factors, focus much more on the significant role for endogenous forces (Stimson & Stough, 2008).

Fig 1.

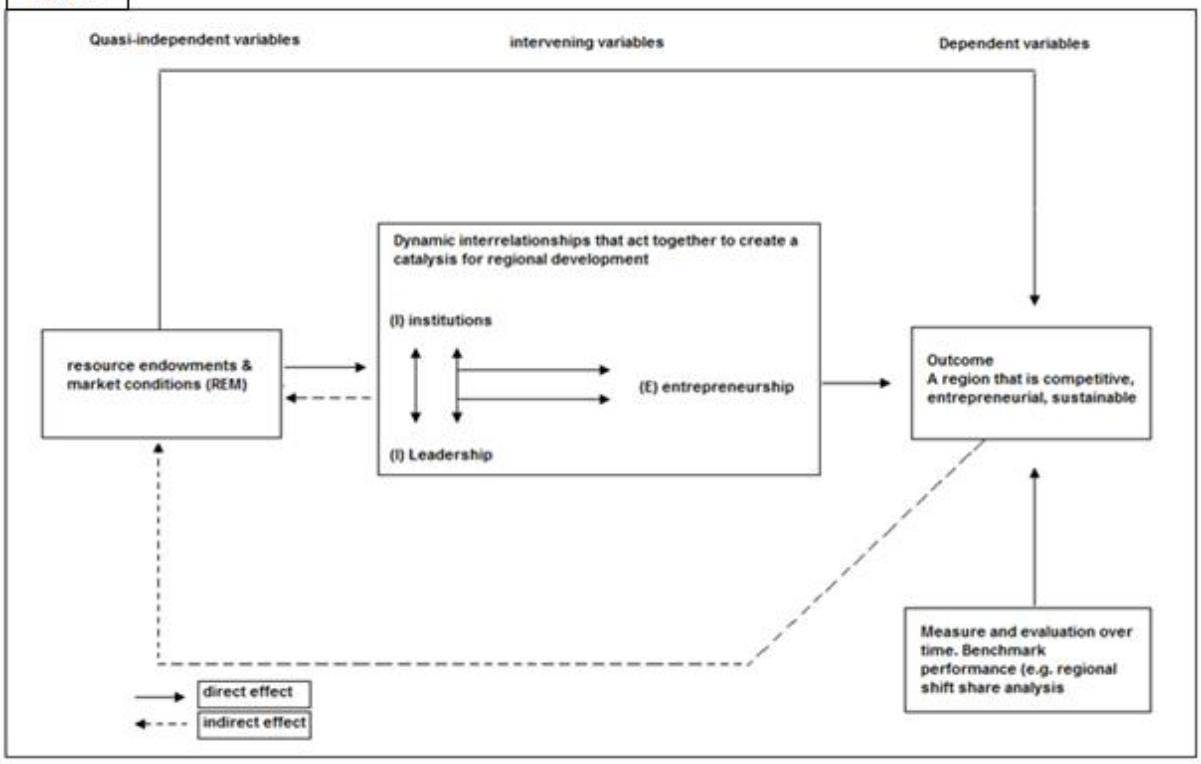


Figure 1 provides a schematic overview of Stimson's (2009) proposed endogenous model concerning regional (local) economic development. This model states that sustainable development of a city or region will be achieved through a process whereby effective institutions and proactive and strong leadership improve the capacity and capability of a place to make better use of its resource endowments and gain an improved market fit in becoming more competitive and entrepreneurial (Stimson, 2009). Stimson (2009) emphasized that Leadership (L) and Institutions (I), and how they interact to facilitate entrepreneurship (E) are crucial elements for achieving sustainable development. In addition a city or region's resource endowments and its fit in relation to market conditions (REM) are as well significant factors affecting regional economic development, performance and growth. However, institutional factors and leadership may serve to improve or detract from the effectiveness and efficiency with which those resources are used and markets are captured (Stimson, 2009).

The Stimson model makes use of certain components which require a brief explanation in order to get a deeper understanding of the presented model framework. With regard to the quasi-independent variable REM it can be argued that the more endowed a region is in terms of resources the better it should perform ceteris paribus (Stough et al., 2001). The dependent

variable refers to a region that is competitive and entrepreneurial. Stimson (2009) refers that this dependent variable can be analyzed and evaluated through the usage of performance indicators such as:

- The competitive performance of a certain city or region in relation to other places
- The degree of entrepreneurial activity taking place
- The degree to which it has attained sustainable development in relation to economic growth and performance, social equity and environmental quality indicators.

Next to the quasi-independent variable and the dependent variable of this model framework, Stimson heavily emphasizes the critical role of the intervening variables: interaction between leadership, institutions and entrepreneurship. Leadership according to Stimson (2002: 279) refers to a collaborative relationship between institutional actors encompassing the private, public and community sectors – and it will be based on cooperation and mutual trust. Institutions are viewed by Stimson as crucial by providing the 'rule structures' and the 'organisations' within which a society operates (Stimson, 2009). In each regard, entrepreneurialism given the context of a city or region contains the element of uncertainty that is viewed by many as the very essence of entrepreneurial activity (Stimson, 2009).

2.3 Introducing the influence on entrepreneurship and LED by a technology push (exogenous factor) through franchising (intervening variable): The previous section introduced Stimson's (2009) model which attempts to provide a simplification of the local economic development process. Stimson's endogenous model proposed an interesting perspective which stated that leadership (L), institutions (I), and entrepreneurship (E), are important factors in achieving sustainable local economic development. The endogenous growth model by Stimson includes many factors which endogenously influence entrepreneurship and with that local/ regional economic development. Stimson's model (2009) does, however, not provide a universal model or framework which is able to guarantee success for regional economic development (Stimson, Stough, 2008). Given this, it can be stated that the literature concerning local economic development, Stimson's model (2009) in particular, provides interesting points of departure to further explore the possibilities of achieving sustainable local economic development.

This study recognizes the academic work on local economic development, Stimson's (2009) model in particular, however it believes that an interesting and important research approach

neglected by Stimson (2009) lies in the inclusion of a technology push (exogenous factor[1]) carried out by a franchising model (intervening variable) to influence entrepreneurship and with that local economic development in remote localities in developing countries. Stimson and Stough (2008) do mention the work of the scholars Johansson, Karlsson and Stough (2001) which state that factors arising from the resource endowments and knowledge base of a particular region can be seen as fundamental endogenous drivers of regional economic development: entrepreneurship, innovation, leadership, institutional capacity and capability, learning and the adoption of new technologies. However, Stimson's (2009) model only focuses on the interaction between leadership, institutions and entrepreneurship and does not include innovation, learning and the adoption of new technologies as fundamental endogenous drivers to create sustainable local economic development. This study is in particular interested to include technology push as a fundamental driver in the local economic development process. Although Johansson, Karlsson and Stough (2001) view the adoption of new technologies (technology push) as endogenous to the process, this study argues that the adoption of new technologies (technology push) is exogenous to the process of local economic development. This is due to the fact that this research is conducted in remote locations in *developing countries*, with very little to no technology available (need for external technology push) as opposed to for example the conducted research of Stimson and Stough (2008), who collected data from different cases in *developed countries*: US, UK, France, Hong Kong and Singapore which possessed the opportunity of endogenous new technologies based on their developed resource endowments.

As previously mentioned this study focuses on the inclusion of a technology push carried out by a franchising model to stimulate entrepreneurship and with that local economic development. The main reason for using franchising as an intervening variable to carry out the exogenous technology push and with that stimulate entrepreneurship can be found in the pressing need according to former U.S. president Bill Clinton to find out what works to solve socio economic problems and scale it up. Additionally, Stansworth ,Price, Porter, Swabe and Gold (1995) argue that franchising can be seen as a source of technology-transfer[2] to developing economies. Franchising has been successfully used in the for profit sector to implement new technologies (technology push) for a long time, however it is still

[1] In this context, exogenous refers to its source: external technological change originating from foreign sources as opposed to internal (endogenous) sources such as domestic private or public enterprises. (Zaman & Goschin, 2010)

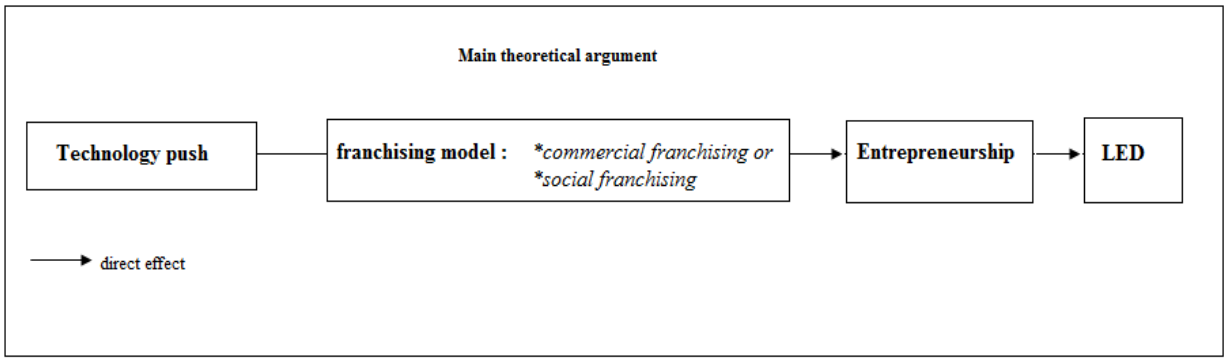
[2] An implicit feature of a franchise system is the concept of technological transfer and the 'learning organisation' (Stansworth, Price, Porter, Swabe and Gold, 1995)

insufficiently used and propagated in the non-profit sector (Hartmann & Linn, 2008). It is for this reason that the new emerging concept of social franchising will be theoretically compared with commercial franchising.

Since little in the field of local economic development is written on the linkage between technology push, entrepreneurship and franchising, it serves as no surprise that the next section of this literature review will link and provide insights with regard to technology push, franchising (commercial and social franchising) and entrepreneurship. The section will be guided by the main theoretical argument of this study and will be divided in three parts which will commence with the part concerning technology push, followed by a part concerning franchising and lastly a part focusing on entrepreneurship.

Figure 2 provides a schematic representation of the main theoretical argument of this study, which argues that a technology push should be carried out by a franchising model in order to stimulate entrepreneurship and result in sustainable local economic development in developing countries.

Fig. 2



Regarding the structure it can be stated that the part concerning technology push will focus on defining the concept, offer insights from previous studies focusing on technology push and provide linkages between technology push and local economic development. The part concerning franchising will in principle focus on the same matters as provided in the part focusing on technology push, however the part concerning franchising will in addition compare commercial franchising with the newly emerged social franchising. Lastly the part concerning entrepreneurship will focus on defining the concept, providing linkages between entrepreneurship and local economic development and offer additional insights with regard to previous studies concerning entrepreneurship.

2.3.1 Technology push:

Definition: Over the years many scholars have attempted to provide an inclusive definition of the concept technology push (Stewart, 1978; Rees, 1979), this study will adopt the definition of Herstatt & Lettl (2004) which states that a technology push can be described as a situation where an emerging or new combination of technologies provides the main driving force for innovative product and problem solution in the market place.

Previous studies concerning technology push*:* Although the literature concerning technology push and local / regional economic development is scarcely available, some authors have attempted to make contributions covering both fields. Scholars have showed how technology is directly related to traditional concepts such as agglomeration economics in regional economic development, and more recently to new or re-named older concepts of institutions, leadership and entrepreneurship (Stimson, Stough & Roberts, 2006). Furthermore Thomas (1975) and Erickson (1994) showed how technical change is linked to the competitiveness of regions.

Next to this, various authors adopted different perspectives regarding technology push (new technologies) as an endogenous or exogenous factor affecting economic development. Theorists such as Barro (1990), Rebelo (1991), Romer (1986), Grossman & Helpman (1991), and Arthur (1994) sought to explain technical progress and its role as the main generator of economic development as an endogenous effect, rather than accepting the traditional neo-classical view of long term growth being generated through exogenous factors. Whereas the work of Arend (1999) who concentrated on the emergence of entrepreneurs following exogenous technological change, claimed exactly the opposite by assuming that the availability of new technologies (technology push) is an exogenous event.

On a more general note and solely focusing on a technology push, it can be stated according to Gerpott (2005) that the main characteristics of a technology push can be perceived as containing high technological uncertainty, uncertain time-to-market, difficult R&D customer integration, a qualitative approach to market research and an extensive need for change of customer behaviour. Herstatt & Lettl (2004) furthermore emphasize that technology push projects generally possess high market uncertainty and that a technology push can encompass a substantial period of time of over more than ten years.

Technology push as a factor influencing local economic development: One of the first scholars which claimed that technology (push) should be recognized as a major factor influencing local economic development, was Solow (1957). Solow's (1957) empirical finding, stating that around 85% of American economic growth from 1909 to 1949 can be attributed to technological change, basically forced the recognition of technology as a major factor in economic growth and development of regions. Supplementary early support for adopting technology push as a factor influencing local economic development can be found in the work of both Stewart (1978) and Rees (1979). Stewart (1978) proposed in her study a virtuous circle, in which local small-scale labour-intensive technologies devised through indigenous innovation and the selective use of foreign technology, lead to a balanced economy with more equal income distribution and reduced unemployment. Furthermore Stewart (1978) argued that the technology factor is a vital element in the development process. Additionally, Rees (1979) in his study focused on the assessment of technology based economic policies and on economic development and argued that the technology factor was a prima driver in the regional economic development process. Additionally the work of Malecki (1983) which reviewed in his study the wide range of research themes which relate to technology and regional development, stated that technology/ technological change is arguably one of the single most important (and probably most overlooked) influences on regional economic change. Furthermore Maleckie (1983) argues that the role played by technology in regional development appears to be far greater and more complex than suggested by models of regional growth and development.

Preliminary conclusion Technology push: In conclusion this section concerning the technology push has attempted to point out theoretically that a technology push is of great importance for regional economic development indicated by the work of Solow (1957), Stewart (1978) and Rees (1979). With regard to the main guiding theoretical question it can be stated that a technology push can definitely be considered as a concept to stimulate local economic development. However, it should be noted that technology push projects possess according to Gerpott (2005) and herstatt & Lettl (2004) a high uncertainty concerning the implementation. Given this, the next section will focus on the intervening variable franchising (fig 2 main theoretical argument). Since fig 2 makes a distinction between commercial franchising and social franchising as forms of franchising (intervening variable), it is necessary to provide insights with regard to both approaches and consider which approach is

theoretically most suited to introduce a technology push in remote locations in developing countries.

2.3.2. Franchising:

Definition: It can be stated according to Choy and Goh (1997) that franchising, as a business model, has no fixed definition, since franchising arrangement in practice always vary due to differing needs of both franchisors and franchisees. However, franchising and franchise-type arrangements tend to involve the owner of a proven business which grants the right and provides the necessary assistance and support to a participating party to replicate his or her business (or to establish another business), elsewhere, in a different geographical location (Choy & Goh, 1997). Since this study is concerned with what kind of ownership variety would be best in introducing a technology push to stimulate entrepreneurship and local economic development it will be inevitable to discuss next to (commercial) franchising, the emerging concept of social franchising in order to scale up production and reach sustainable regional economic development in developing countries. A comprehensive definition provided by the World Health Organization (WHO) and USAID (2007) state that a social franchise is an adaptation of a commercial franchise in which the developer of a successfully tested concept (Franchiser) enables other (franchisees) to replicate the specific model using the tested system and brand name in order to achieve a social benefit. In return the franchisee is obligated to comply with quality standards, report sales and service statistics, and in some cases pay franchisee fees (WHO & USAID, 2007). This study will when using commercial franchising and social franchising refer to the definitions provided by Choy & Goh (1997) and WHO & USAID (2007).

Previous studies concerning franchising: Having defined (commercial) franchising and social franchising it will be of importance to provide insights with regard to commercial franchising and the emerging concept of social franchising. Firstly, the essence and main theoretical foundation of commercial franchising will be discussed. Secondly, the emerging usage of social franchising will be introduced. Thirdly, the main differences between commercial and social franchising will be discussed.

Essence of commercial franchising: The term ‘franchising’ originated in France and was formed during the 18th century. The term ‘franchising’ translates as ‘granting of a right’ or ‘an

exemption' (Williamson, 1992). The scholars Curan & Stansworth (1983) regard commercial franchising as "a business form essentially consisting of an organization (the franchisor) with market-tested business package centered on a product or service, entering into a continuing contractual relationships with franchisees, typically self-financed and independently owner-managed small firms, operating under the franchisor's name to produce and or/ market goods or services according to a format specified by the franchisor."

Fig. 3

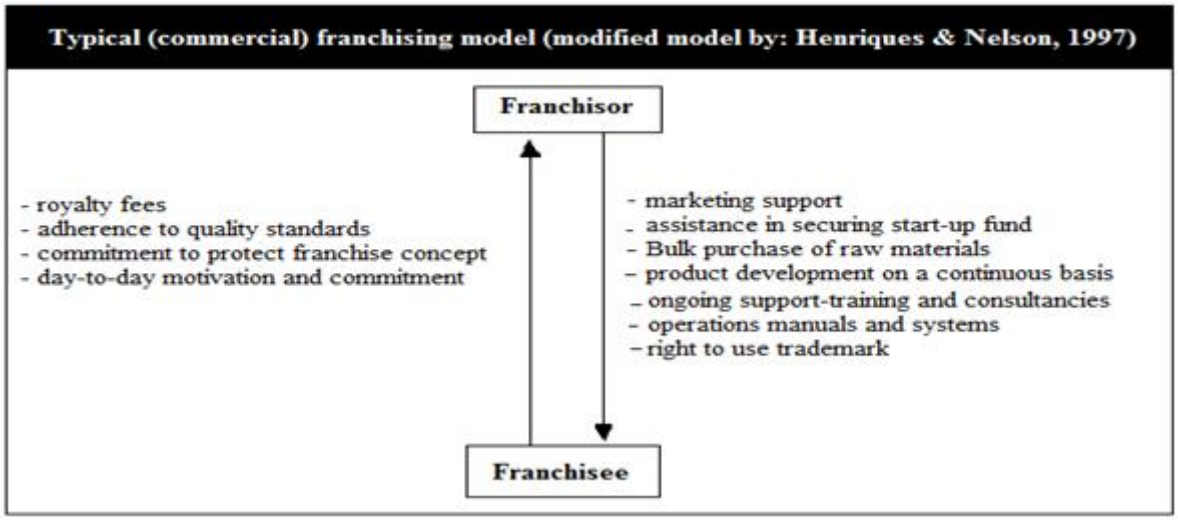
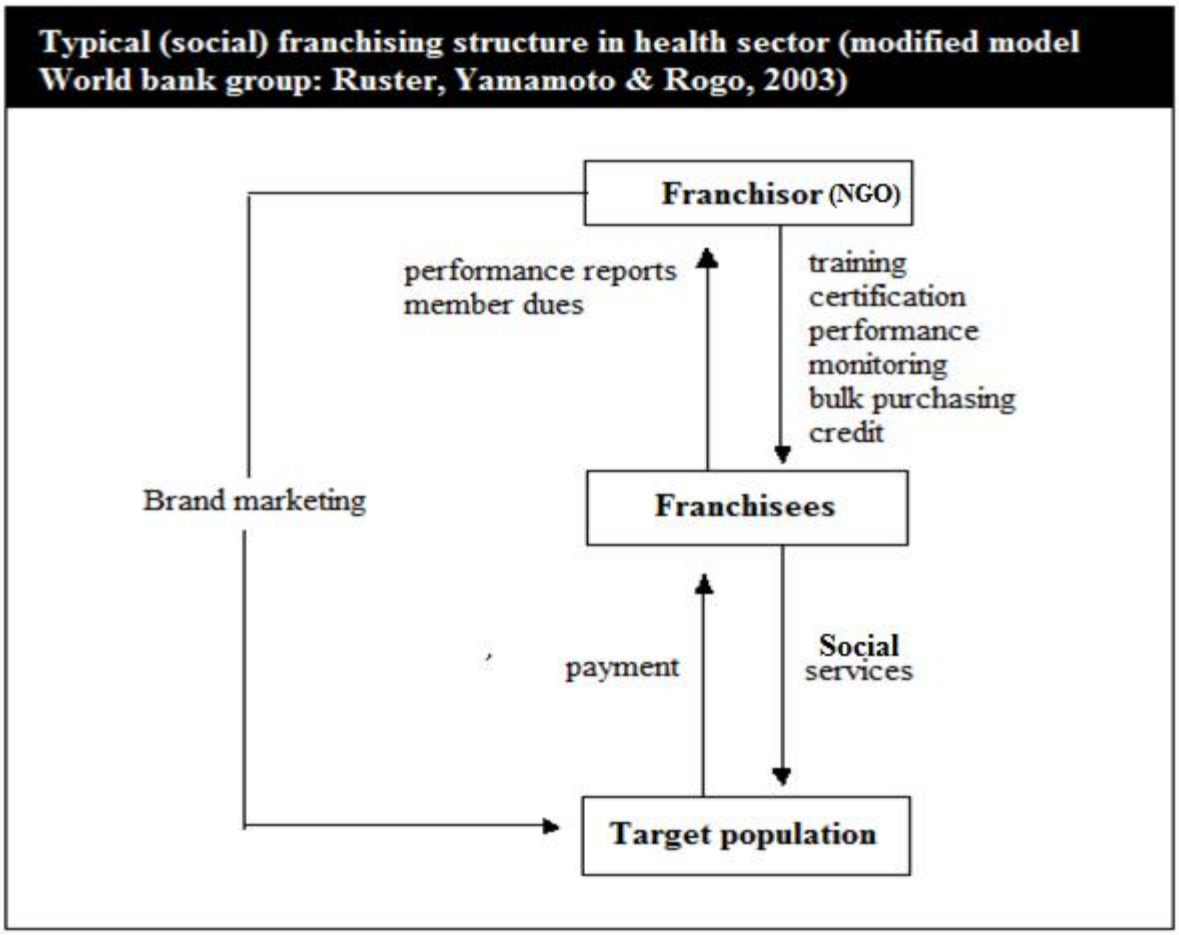


Figure 3 provides a typical basic (commercial) franchising model made by Henriques and Nelson (1997). The model clearly indicates the typical flow of services and support from franchisor to franchisee and from the franchisee to the franchisor. As can be seen from the figure it can be stated that franchising is a way of doing business whereby the franchisor (the owner of a proven business system) grants the right by contract to a potential entrepreneur (franchisee) to establish a similar kind of business (Henriques & Nelson, 1997). This model clearly indicates that a franchisee will receive marketing support, assistance in securing start-up fund, bulk purchase of raw materials, product development on a continuous basis, ongoing support-training and consultancies, operations manuals and systems and the right to use the trademark if he or she adheres to the requirement of providing the franchisor with royalty fees, adherence to quality standards, commitment to protect franchise concept and day-to-day motivation and commitment (Henriques & Nelson, 1997). Furthermore it can be stated according to Henriques & Nelson (1997) that adopting a commercial franchising business model can foster rapid growth and can be focused on business sectors which will be able to provide the desired economic stimulus for economic development. Additional studies such as

the work of Astley (1984), Astley & Van de Ven (1983) and Hawley (1950) mention potential advantages of adopting a franchising model; both the franchisee and the franchisor can benefit from participating due to 'collective action' / partnership. Another potential benefit arising from franchising can be found in the fact that once established, a franchise according to Dandridge et al (1993) may provide the greatest stability. This is due to the franchisor which has a vested interest in an image of stability and growth. The study of Dandridge et al (1993) furthermore mentioned that many researchers have noted that these beneficial factors described above are commonly less available in rural areas. It is therefore that the advantages of adopting a franchising system may be particularly evident to the rural entrepreneur (Dandridge et al, 1993). Even highly successfully business systems such as the franchising concept are however subject to certain disadvantages when in use. One of the main drawbacks of adopting a franchising system lies in the risk of parties not being able to obtain the right information. According to Henriques and Nelson (1997) the franchising efforts could be jeopardized if the parties lack a great deal of knowledge concerning legal, accounting aspects, marketing information and management. The biggest potential disadvantage of franchise systems lies according to Alon, Alpeza & Erceg (2007) in farnchisee's infringement of agreement provisions dealing with quality standards. Next to this, Parivodic (2003) identifies another potential drawback from a franchisor's point of view originating in the potential loss of control over the franchise network.

Insights concerning social franchising: The concept of social franchising is a relatively new concept, this explains why not yet much has been written by scholars and practitioners all

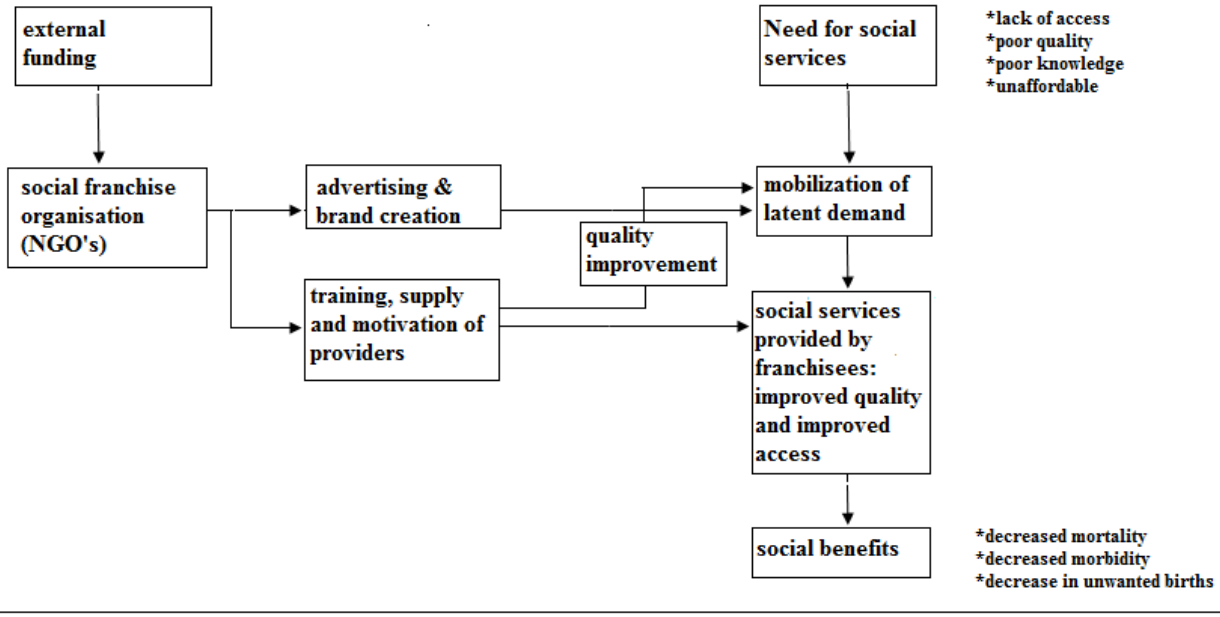
Fig 4



over the world. Social franchising is basically a variation on commercial franchising applied in the non-profit sector which focuses on creating social value in developing countries. Hartmann & Linn (2008) already mentioned that commercial franchising has been successfully used in the commercial sector for a long time; however the usage and possibilities of franchising in non-profit sector have not yet been sufficiently propagated and published. The main theoretical contributions and empirical research concerning social franchising comes from various fields ranging from healthcare to education. This is indicated by early results which indicate that social franchising business models can 'rapidly expand health coverage to the poor, capture economies of scale and reduce the information asymmetries that often adversely affect the quality of care (Ruster, 2003). Figure 4 provides an example of a typical (social) franchising structure applied in the health care sector by Ruster, Yamamoto and Rogo (2003) developed for the World Bank Group. It can be stated

that franchisors in the health care sector are often supported by international donors and nongovernmental organizations (NGO's), which establish protocols, provide training, certify those who qualify, monitor the performance of the franchisees, provide brand marketing and bulk procurement (Ruster, Yamamoto and Rogo, 2003). This is supported by Montagu (2002) who argues that a social franchise system is usually run by a non-governmental organisation. Ruster, Yamato and Rogo (2003) argue concerning figure 4 that the franchisees report the performance of their members to the franchisor, provide services to the target population and receive payment for their work. Next to the model provided by Ruster, Yamamoto and Rogo (2003), Montagu (2002) provides a different example of a social franchising model. Figure 5

Fig 5. Modified social franchising model Montagu (2002)



shows a schematic representation of the social franchising model.

Montagu (2002) argued in his work concerning franchising of health services in developing countries that social franchising could be seen as an attempt to use franchising methods to achieve social rather than financial goals. The social franchising model made by Montage (2002) argues that the social franchise organisation (where the franchisor usually is a NGO) needs external funding in order to be able to conduct its social service activities and generate through the franchisees social benefits. Similar to commercial franchising models the social franchise organisation provides advertising, brand creation and training. Next to this, the social franchise organisation is build around the need for social services to improve the lack of access, poor quality, poor knowledge and unaffordable health services and by the social franchising approach create social benefits to the communities which potentially decrease

mortality, decrease morbidity and decrease unwanted births in developing countries (Montagu, 2002).

Next to the different examples of Ruster, Yamamoto and Rogo (2003) and Montagu (2002) various other scholars and development practitioners have suggested different benefits and challenges with regard to potential social franchising models. Beck, Deelder and Miller (2010) for example argue that social franchising will be able to create a more efficient and scalable distribution model for public/ social goods and services such as healthcare and education; this is due to its assumed potential of providing rapid scale-up, creating a strong brand, quality standards and foster local ownership. Piggot (2004) adds that social franchising represents one of the most promising strategies for encouraging growth and propagating best practice. Piggot (2004) in addition argues that social franchising will create a series of partnerships whereby the parent organizations gets a relatively risk-free route to rapid growth; the franchisee furthermore will experience reduced risks and a ready-made business model with all the benefits that comes along with it. Next to potential benefits, it serves as no surprise that social franchising faced several challenges. According to Meuter (2008) it can be stated that due to the fact that social franchising projects are normally developed with specific geographic focus in mind, there is a risk of changing the initial mission when the model would be adapted to other locations. Meuter (2008) in addition mentions that since achievements in social franchises cannot be as easily as, for example, units sold in the for profit sector, evaluating and monitoring of franchisees performance will be a challenging task. Ruster, Yamamoto and Rogo (2003) in addition, emphasis the asymmetry of information as a potential challenge for social franchising. Concluding it can be said that successful social franchising examples which benefit from the advantages and cope with the faced challenges can be found in the work of BRAC and the Grameen Bank, which are both replicating and scaling up their programs concerning micro credit in developing countries (Hartmann & Linn, 2008).

Major differences between commercial and social franchising: Since social franchising applies the principles of franchising it does not come as a surprise that both approaches have much in common; a clearly defined product, the way of delivering the product, strict quality criteria, quality assurance and a brand that can be accessed by service providers (Lonroth, Aung, Maung, Kluge & Uplekar, 2007). Social franchising and commercial franchising do however have their differences: the overarching difference being the fact that commercial

franchising is profit driven and social franchising seeks to fulfil a social benefit (not for profit) (WHO & USAID, 2007). Meuter (2008) emphasises and describes in her study the substantial differences between the for profit and not-for-profit sector and how these differences result inevitably in adapted and different business model approaches (commercial and social franchising). One of the differences lies according to Meuter (2008) in either operating a franchising model as a business in the profit sector, which has the main aim of maximising profit, or as an organisation in the non-profit sector, which will have the main goal of maximisation of social impact. In addition the target group in both cases will be different; a non-profit organisation will most likely serve beneficiaries rather than customers. This basically means that the franchisor (the organisation) cannot always expect to receive payments from the beneficiaries. Given this, the approach taken by the organisation as opposed to the business will be different. Another interesting difference pointed out by Meuter (2008) between the for profit and not-for-profit sector, lies in the fact that non-profit projects are usually in need of financial support in order to remain sustainable, whereas for profit project are generally financially self sustainable. In conclusion Meuter (2008) argues that while a franchise system without fees is unimaginable in the commercial sector, the social franchisor must be prepared to either find alternatives to financial compensation or settle for reduced fees. McBride and Ahmed (2001) largely agree with the perspective taken by Meuter (2008) and point out that the financial benefits of the social franchising agreement do not extend to the franchisor, as they do in commercial franchising. Additionally, McBride and Ahmed (2001) mention that the theory behind social franchising is similar to that of social marketing; in both cases, proven commercial strategies are applied to serve the social sector in order to achieve social goods, such as improving the living conditions in a certain area (McBride & Ahmed, 2001).

Technology push carried out by *franchising model* linking with entrepreneurship and local economic development: The previous paragraphs of franchising focused on defining both social and commercial franchising, provided insights with regard to the main theoretical foundation of franchising and displayed the main differences between commercial and social franchising. This paragraph will provide insights with regard to the linkages between franchising (as intervening variable), entrepreneurship and local economic development to strengthen the theoretical argument in Fig 2 which theoretically stated that a technology push carried out by a franchising model (social or commercial franchising) stimulates entrepreneurship and with that local economic development.

According to Choy and Goh (1997) which focus in their study on using franchising as a vehicle for entrepreneurship development in Singapore, it can be stated that franchising is increasingly being seen as an effective vehicle for promoting (local) economic development. Although there are many different manifestations of the franchising concept and model, effective franchising is according to Alias (1994) needed to contribute towards the growth of the (local) economy. Furthermore and according to Chong (1994) it can be said that franchising is also viewed as a tool for stimulating the development of entrepreneurship. Sorenson and Sorensen (2001) adopt a similar perspective with regard to Chong (1994) and argue that franchising provides an increasingly important instrument for wealth creation and development. Additionally several other studies mention an existing link between franchising and entrepreneurship. Hoy & Shane (1998), Kaufman & Dant (1998) and Norton (1998) link franchising to common entrepreneurial attributes and provide evidence that franchisor failure rates mirror those of other entrepreneurs. Moreover, studies of Bradach (1997), Kaufman & Eroglu (1998) and Yin & Zajac (2004) emphasize that franchisees are a central source of innovation, strategic adaption and learning. Additionally, the scholars Stanworth, Price, Porter, Swabe and Gold (1995) argue that franchising can be viewed as a means of nurturing and developing entrepreneurial talent.

Preliminary conclusion franchising: In conclusion it can be stated that this section theoretically showed how franchising relates to local economic development, technology push and entrepreneurship. Choy and Goh (1997) stated that franchising can be seen as an effective vehicle for promoting (local) economic development. Furthermore this section provided insights with regard to commercial and social franchising focusing on existing models and possible advantages and disadvantages of each approach, illustrated by the work of henriques and Nelson (1997), Meuter (2008) and Ruster, Yamamoto and Rogo (2003). Additionally the main differences between commercial and social franchising were elaborated upon. With regard to the guiding theoretical question of this literature review it can be stated that the best franchising model to introduce a technology push to stimulate entrepreneurship and with that local economic development in developing countries can be found in a combination between commercial franchising and social franchising. This is due to the fact that both approaches provide interesting elements which could be useful and applicable in developing countries. Combining the innovative ideas from the newly developed concept of social franchising with the existing theoretical contributions of commercial franchising would seem to be the best

way to introduce a technology push and stimulate entrepreneurship and local economic development in remote areas in developing countries.

This study now turns its attention to the last factor; entrepreneurship which influences local economic development. The factor entrepreneurship is the last factor in the chain of causality (see fig. 2) which aims to stimulate local economic development by arguing that a technology push should be carried out by a franchising model to stimulate entrepreneurship and with that local economic development. This section concerning franchising already mentioned the close ties between franchising and entrepreneurship. Choy (1994) for example already mentioned that franchising could be viewed as an instrument for small enterprise transformation and entrepreneurship development. It is therefore that the entrepreneurship section will explicitly pay attention providing insights which link entrepreneurship and local economic development. Furthermore, the entrepreneurship section will provide some insights with regard to previous studies focusing on entrepreneurship. The main focus of the section concerning entrepreneurship will lie on establishing a link between entrepreneurship and local economic development.

2.3.3. Entrepreneurship:

Definition: Definition: According to Bull and Willard (1993) it can be stated that over 200 years of study of entrepreneurship have provided many definitions with regard to entrepreneurship and the word entrepreneur, however, no conclusive definition has yet been provided. Drucker (1985) defines entrepreneurship as an act of innovation which involves endowing existing resources with new wealth-producing capacity. Leibenstein (1968) in addition defines an entrepreneur as someone who marshals all resources necessary to produce and market a product that is able to answer a market deficiency. This study will when referring to entrepreneurship and entrepreneurs refer to the work of both Drucker (1985) and Leibenstein (1968).

Previous studies: According to Bull & Willard (1993) it can be stated that no generally accepted theory of entrepreneurship has yet emerged. Bull & Willard (1993) refer to the fact that a diverse set of scholars and practitioners with different backgrounds in agriculture, anthropology, educations, economics, finance, history, marketing, political science, mass communications, psychology, strategy and sociology have contributed to the existing body of research in entrepreneurship. According to Wortman (1992) it can be stated that despite the

potential for richness and texture with a diverse mix of discipline contributing to the field, the major weakness is that, in many cases, researchers from one discipline have been ignoring the entrepreneurship studies from scholars in other disciplines. A possible result of scholars ignoring the work of other practitioners can according to Wortman (1992) be found in the fact that the field of entrepreneurship lacks sufficient frameworks which are able to cut across disciplines and disciplinary relationships. The existing literature concerning entrepreneurship can be grouped into five broad categories. The first category focuses according to Bull and Willard (1993) on defining the word 'entrepreneur'. Schumpeter (1942) for example saw the entrepreneur as a leader and major contributor to the process of creative destruction. The second category concentrates on the 'trait approach', i.e., the study of the psychological traits of people who can be identified as entrepreneurs (Bull & Willard, 1993). The scholars Low and MacMillan (1988) for example offer an interesting review of the literature concerning psychological theories about the entrepreneur. The following quote by Low and MacMillan (1988) illustrates their conclusion: "Being innovators and idiosyncratic, entrepreneurs tend to defy aggregation. They tend to reside at the tails of population distributions, and though they may be expected to differ from the mean, the nature of these differences are not predictable. It seems that any attempt to profile the typical entrepreneur is inherently futile (p.148)." The third category concerns the study of success strategies concerning entrepreneurship, reasons offered to basically explain the potential success of new and existing business ventures (Bull & Willard, 1993). The fourth category of entrepreneurship focuses on the study of the formation of new ventures (Bull & Willard, 1993). The last category considers the environmental factors on entrepreneurship. Bull and Willard (1993) mention that the environment undoubtedly influences entrepreneurship; it can be supportive, however it can also provide challenges. Cooper (1993) generally agrees with Bull and Willard (1993) and points out that environmental developments with regard to entrepreneurship can help and hurt.

Linkage between entrepreneurship on local economic development: In the field of regional economic development, the role of small businesses, and in particularly new ventures and entrepreneurs, has been receiving increasing attention (Allen & Hayward, 1990). Dandridge & Falbe (1992) add that entrepreneurship has been presented in a very favourable light globally during the last decade. In addition the creation of sustainable economic growth and vitality is according to the Worldbank (World Development Report, 2005) highly dependent on private enterprise and entrepreneurship: "People taking innovative approaches to development in frontier economies are increasingly using private-sector mechanisms to

address development challenges, ranging from failures along the supply chain to provision of essential services (Worldbank, 2005)." Birch (1987) in addition mentions that entrepreneurship and small business will be able to create new jobs and provide a significant contribution to economic development. Longbao (2009) extends the reasoning of Birch (1987) by emphasizing the vital role of entrepreneurship in economic development and the fact that entrepreneurial activity could promote immediate economic growth and enable sustainable development in the future through the promotion of market development, the acceleration of technological innovation and the expansion of employment capacity. In addition Allen & Hayward (1990) contribute by arguing that a consensus has been developed that basically holds that local economic growth/ fortunes are a result of indigenous venture formation, that is, local entrepreneurs. Additionally, Allen & Hayward claim that entrepreneurs (new firm founders) are almost always local residents – there are apparently very few reported cases of an entrepreneur which movers to a new region in order to start a business. This phenomenon has been empirically proven based on the work of Reynolds & Freeman (1986), Allen & Levine (1986) and Cooper (1985). This phenomenon has apparently been so well established that it could be taken as an axiom. As such it highlights the significance of the region as a determinant of rates of new firm formation/ entrepreneurship and thus further accentuates the importance of economic development. Concluding, the following quote by the Worldbank illustrates the significance of entrepreneurship as a driver of local economic development: *"Small private firms are at the heart of the development process. Driven by the quest for profits, firms of all types – from farmers and micro-entrepreneurs to local manufacturing companies and multinational enterprises – invest in new ideas and new facilities that strengthen the foundation of economic growth and prosperity. They provide more than 90% of jobs – creating opportunities for people to apply their talents and improve their situations. They provide the goods and services needed to sustain life and improve living standards. They are also the main source of tax revenues, contributing to public funding for health, education, and other services. Firms are thus central actors in the quest for growth and poverty reduction (Worldbank)."*.

Preliminary conclusion entrepreneurship: The main focus of this section was to establish a theoretical link between entrepreneurship and local economic development to strengthen the last factor in the chain of causality which states that a technology push should be introduced by a franchising model to stimulate entrepreneurship and with that local economic development. The combined work of the Worldbank (2005), Birch (1987), Longbao (2009) and Allen & Hayward (1990) provided insights which indeed linked entrepreneurship to local

economic development. Concluding it is interesting to note that the field of entrepreneurship although much researched by various authors from different fields, does need additional research which will not disregard the work by various others form different fields.

2.4 Overall Conclusions and answering of main theoretical question:

This literature review commenced with proposing the main theoretical question which would serve as a guideline throughout this literature review. The main theoretical question focused on the following: *What kind of ownership variety (commercial or social franchising) would be best in introducing a technology push to stimulate entrepreneurship and with that local economic development in remote areas in developing countries and how do technology push, franchising and entrepreneurship theoretically relate to local economic development?*

In order to provide a clear answer to this combined theoretical question, the literature review commenced by introducing the overall theme of local economic development and a highly relevant model of Stimson (2009) which focused on local economic development. Next to this the main theoretical argument (Fig 2) was provided and the sections concerning technology push, franchising and entrepreneurship provided theoretical insights from scholars and practitioners to support the statement that a technology push carried out by a franchising model would be able to stimulate entrepreneurship and with that local economic development. Regarding the first part of the main theoretical question it can be stated that both commercial and social franchising provided interesting business models to stimulate economic development and the potential for scaling up. Since the theoretical question concerns economic development of localities in developing countries it serves as no surprise that social franchising model, which aims at creating social value (solving socio economic problems) would be the preferred choice. However the sustainability of such a model can be questioned since the social franchising model is highly financially dependent on donors or organisational financial support, whereas the normal commercial franchising model is profit focused and financially self sustainable. This study believes that an integrated business model combining social franchising and commercial franchising with insights from healthcare, education and business could serve a social value creating purpose while being financially self-sustainable. Since the main theoretical question of this research includes an integrated question, attention will now be turned to the second part which focuses on the theoretical question; how do technology push, franchising and entrepreneurship theoretically relate to local economic development? This theoretical question can immediately relate to the main proposed

theoretical argument which stated that a technology push carried out by a franchising model can stimulate entrepreneurship and with that local economic development. The sections concerning technology push, franchising and entrepreneurship were structured in such a way that they provided theoretical insights from scholars who linked the factors in such a way that the theoretical argument was being supported.
In conclusion it can be stated that a technology push carried out by a franchising model could influence entrepreneurship and with that local economic development. Additionally a combination of a social and commercial franchising model could according to this study best introduce a technology push to stimulate entrepreneurship and local economic development.

This combined answer is however purely theoretically and needs to be empirically examined. The research methodology will briefly introduce two developed models to empirically examine the feasibility of implementing a technology push in the aforementioned way and empirically examine whether the main theoretical argument of this study holds.

3. Research Methodology

Since the previous section discussed the relevant literature, introduced a new factor (technology push) and intervening variable (franchising) influencing local economic development and provided the main theoretical argument (fig 2), this study turns its attention now to the main methodology used for this research. The methodology used in this study is of vital importance since it will provide a tool for examining the earlier described theoretical argument and the feasibility of introducing a technology push. This section will provide several insights and will start with introducing the two models which will empirically examine the feasibility of introducing a technology push in remote areas in developing countries and examine whether the main theoretical argument of this study holds. Additionally the factors/ variables used in the two models will be related to the empirical reality. Thirdly, the overall research strategy will be elaborated upon, followed by a map of the visited case locations and socio economic profiles of the different villages. Finally, the way the data was gathered will be elaborated upon by a multi method data collection approach specifically developed for this study.

3.1 Introducing model 1 (examining feasibility of technology push) and model 2 (examining main theoretical argument)

Model 1 and model 2 are both based and inspired on the insights from the Stimson (2009) model and the introduced literature concerning technology push, franchising, entrepreneurship and local economic development. In order to clearly present the empirical results of this study it was necessary to create two models. Both models are closely related since similar levels of analysis are used and technology push (A) and franchising (B) play a role in both models. Model 1 provides a tool for analyzing the feasibility of introducing a technology push in remote areas in developing countries. Additionally model 1 provides insights with regard to whether a technology push carried out by a franchising model is feasible and if social or commercial franchising is preferred by both levels of analysis (institutional and community level). Model 2 provides a tool for examining whether the main theoretical argument of this holds.

Model 1: examining the feasibility of introducing a technology push		
level of analysis / factors	**Institutional level** (low, middle and high institutional level) (Stimson et al, 2009)	**Community level** (Israel et al, 1994)
Technology push (A) (herstatt & Lettl, 2004)	*Going from high to low feasibility*	*Going from high to low feasibility*
Franchising (B)	*Going from high to low feasibility*	*Going from high to low feasibility*
▪ **Preference social or commercial franchising** (Choy & Goh, 1997; WHO & USAID, 2007)	*Social or commercial franchising*	*Social or commercial franchising*

Model 2: examining main theoretical argument		
level of analysis / factors	**Institutional level** (low, middle and high institutional level) (Stimson et al, 2009)	**Community level** (Israel et al, 1994)
Technology push (A) carried out by Franchising model (B) *influences* entrepreneurship (Drucker, 1985)	*Positive, negative or no influence*	*Positive, negative or no influence*

3.2 Relating factors and levels of analysis from model 1 and 2 to the empirical reality:

This paragraph will focus on explaining and relating the previously introduced models (model 1 and 2) and the included factors introduced in the literature with the empirical reality.

Since the literature review extensively discussed the factor technology push, the intervening variable franchising and entrepreneurship, this section will commence with defining the levels of analysis (institutional level and community level) and provide an argumentation for focusing on both institutional and community level. Following these insights, the study will relate the factors of both model 1 and 2 with the empirical reality starting with technology

push, franchising and entrepreneurship. Finally, criteria for possible outcomes of the both models (feasibility, social, commercial franchising and influences) will be elaborated upon.

Level of analysis: Institutional and Community level: Regarding both model 1 and 2 it can be stated that the level of analysis consist of two levels: institutional and community level. Since this study is concerned with examining the feasibility of introducing a technology push in remote areas, an analysis concerning different levels is necessary and of importance to get a rather complete and thorough overview of the situation and provide a platform to analyse the various linkages between the levels. This study focuses on the ***community level*** (which is mentioned by Woller 2004) and the ***institutional level*** *(low, middle and high institutional level)* which is also identified by Hulme (2000) to study the impact of development interventions. An additional reason for focusing on both institutional and community level can be found in the reasoning of Manurung, Siswanto and Simatupang (interview, 2012) who stated that smallholder rubber farmers are often neglected as major stakeholders by both big commercial companies and institutional departments. So instead of neglecting the opinions of smallholder rubber farmers, this study clearly focuses also on the community level next to the various institutional levels.

- With community, this study theoretically refers to the combination of the work of Sarason (1984), Klein (1968) and Steuart (1978), integrated by Israel, Checkoway, Schulz and Zimmerman (1994) who state in their paper that community refers to: "a local or domain that is characterized by the following elements: (1) membership – a sense of identification and belonging; (2) common symbol systems – similar language, rituals, and ceremonies, (3) shared values and norms; (4) mutual influence – community members have influence and are influenced by each other; (5) shared needs and commitment to meeting them; and (6) shared emotional connection-members share common history, experiences, and mutual support." This study relates community (level) to the empirical reality by focusing on the combined insights gathered from the interviews with the smallholder rubber farmers in Taruna Jaya, Pilang, Jabirin and Buntoi as will be elaborated upon in the results section.
- Regarding Institutions: Stimson, Stough and Salazar (2009) define institutions as crucial in providing the 'rule structures' and the 'organisations' within which a society operates. According to Stimson et al. (2009) the 'government' is the system by which a nation, state, city or region is governed. This study relates institutions to the empirical reality by focusing on inputs from head of villages (***low institutional level***),

head of district (***middle institutional level***) and government departments (***high institutional level***). Since this study wanted to provide a comprehensive overview of the situation it was decided to split the institutional level of analysis into multiple sub levels of analysis (low, middle and high institutional level).

Technology push: Herstatt & Lettl (2004) already theoretically defined a technology push as a situation where an emerging or new combination of technologies provides the main driving force for innovative product and problem solution in the market place. In this study the theoretical technology push will be related to the empirical reality of the Mobile-Bio-Diesel project. The Mobile Bio Diesel project will be able to provide rural remote communities with mobile technological equipment in order to produce biofuel from waste products (the rubber nuts). In order to get as much insights from the local community and the institutional levels an interview guide with questions relating to technology push was designed (See appendix 7.1)

Franchising: This study defined franchising along the lines of Choy and Goh (1997) which mentioned the granting of a right from an owner to a participating party to replicate his/her business model elsewhere. In order to get the most out of the interview sessions with regard to franchising it was of vital importance to clearly show what was meant by franchising and relate it to the empirical reality concerning the smallholder rubber farmers (community level) and the head of villages, head of district and government departments (low, middle and high institutional level). A brochure was developed to illustrate the pilot program of the MBD project carried out by a franchising model both in English and Bahasa Indonesia (See Appendix 7.1 and 7.2).

Entrepreneurship: This study theoretically defined entrepreneurship according to the definition adopted by Drucker (1985) who referred to entrepreneurship as an act of innovation which involves using existing resources with new wealth producing capacity. This study relates entrepreneurship to the empirical reality by referring to business-start ups in the local community. Additionally the interview guide (see appendix 7.1) posed questions to both institutional and community level in order to gain more insights with regard to the relation between entrepreneurship and the possibilities of a technology push carried out by a franchising model.

Criteria of possible outcomes of model 1 and 2: Next to the level of analysis and the factors technology push, franchising and entrepreneurship it will be of importance to briefly discuss the criteria for reaching possible conclusions from the two developed models. Firstly, regarding model 1 it can be stated that for the technology push factor a low or high feasibility can be reached. A high feasibility is reached when the stakeholder involved (community or institutional level) shows signs of willingness to participate with the MBD project. Concerning franchising it can be stated that if the stakeholder (community or institutional level) shows signs of willingness to participate in a franchising model (benefiting from learning, coaching, opportunities to get ahead) a high feasibility is reached. Additionally, if the stakeholder believes that a franchising model should focus on the creation of social value instead of solely focusing on profit, a model with social franchising elements is preferred as opposed to a commercial franchising model. Regarding model 2 it can be stated that a positive influence is the likely outcome if the stakeholder (levels of analysis) believes that a technology push (A) carried out by a franchising model (B) will result in more entrepreneurial activities in the local communities.

3.3 The research strategy:

Management research uses a wide variety of research strategies to collect their data; experiment, survey, case study, ethnography and action research are amongst the most common research strategies (Thomas, 2004). This study has used a research strategy which focused on a case-study approach. The case study approach of this research focused on multiple cases and has different levels of analysis (Yin, 1984). This is illustrated by the fact that multiple places have been visited in Central-Kalimantan and various stakeholders such as policy makers, head of districts, head of villages and smallholder rubber farmers have been interviewed in multiple villages. The different villages include the main capital of Central-Kalimantan: Palangkaraya and the remote villages of Taruna Jaya, Pilang, Jabirin and Buntoi (a socio economic profile of these

Map 1.

villages is provided in paragraph 3.4.). These villages are all located in the EMRP-area (Ex-Mega Rice Project area) which covers the main focus area of the MBD project (map 1) The main criteria for choosing these particular villages were found in:

- **Location**: various different locations in the Block B (EMRP area): some villages were located in the north while others were located south.
- **Soil**: peat soil (Taruna Jaya) versus mineral soil (Pilang, Jabirin and Buntoi) (peat soil is less fertile than mineral soil)
- **Size**: small remote village (Taruna Jaya, Pilang), relatively bigger remote village (Jabirin) and large remote village (Buntoi).
- **Differences in economic activity**: fishing 80% (Taruna Jaya) vs rubber 80% (Pilang, Jabirin and Buntoi).

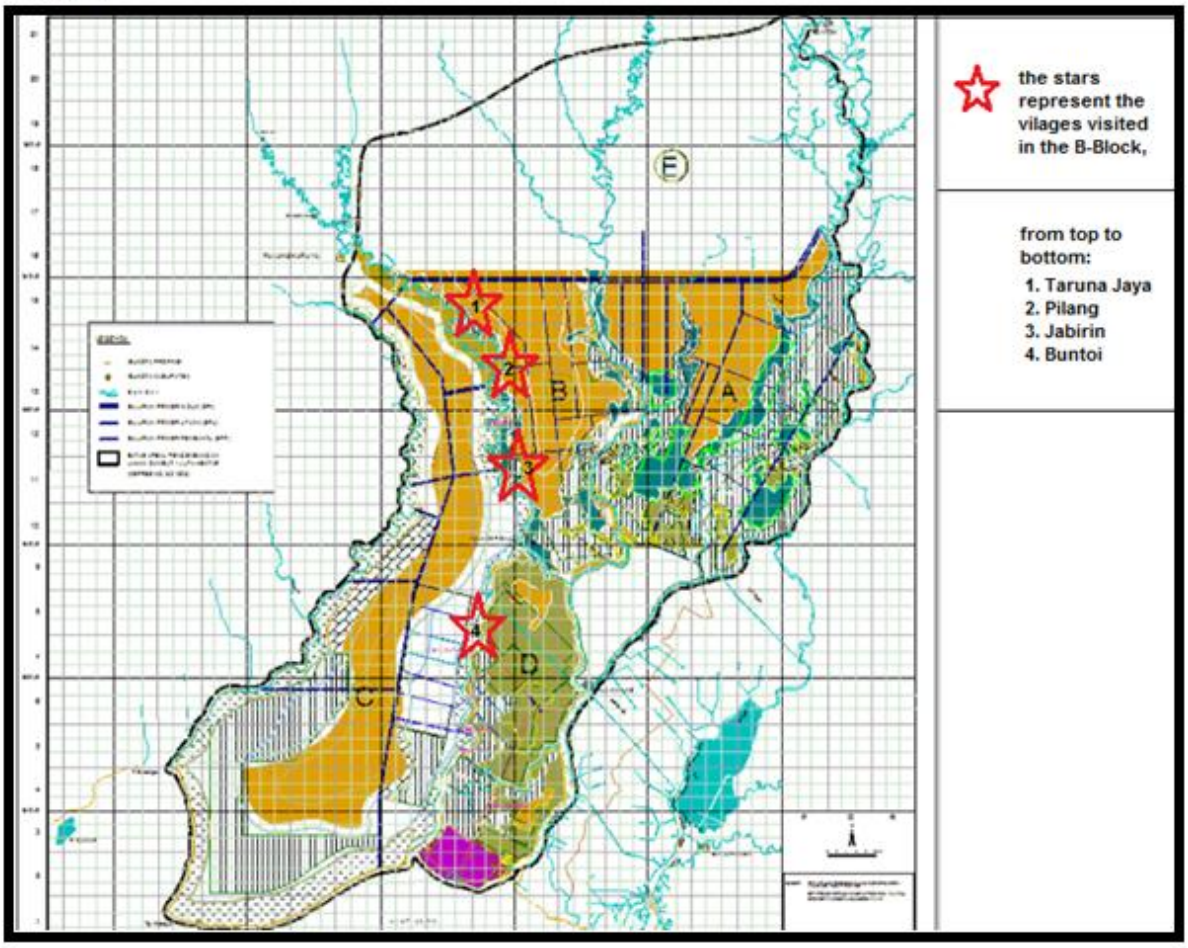
Case studies can be used to achieve various aims: to provide description (Kidder, 1982), test theory (Pinfield, 1986; Anderson, 1983) or generate theory (e.g., Gersick, 1988; Harris & Sutton, 1986). Since the main aim of this study is to find out (explore) what kind of ownership variety: franchising or social franchising can help best in introducing a technology push in agricultural areas to stimulate sustainable local economic development, generating theory will be the main aim of this study. According to Lewin (1945) it can be argued that 'nothing is quite so practical as good theory (Lewin, 1945, p.129). Building theory from case-studies is according to Eisenhardt (1989) a research strategy that involves making use of one or more cases to create theoretical constructs, propositions, or theory form case-based, empirical evidence. This study will use the Mobile-Biodiesel (MBD) project and the related villages (cases) as the basis from which to develop theory inductively. The adopted strategy fits with what Strauss & Corbin (1998) called grounded-theory to conduct qualitative research. It is in their opinion that research does not start with a preconceived theory in mind. Rather, the researcher begins with an area of study and allows the theory to emerge from the data (Strauss & Corbin, 1998). When conducting a case study attention has to be paid to the possible pitfalls and advantages of a case study approach. Eisenhardt (1989) states that one of the main weaknesses of a case involves building theory which tries to capture everything. This will result in a theory which is overly complex by the adoption of a staggering volume of rich data. Another possible pitfall of this approach evolves around the statement of Eisenhardt (1989) that the theorist will be unable to raise the level of generality of the theory. According to Eisenhardt (1989) however there are in addition numerous advantages of conducting a case study. A possible strength lies for instance in the likelihood of generating novel theory from

cases. Furthermore, using a case study will enable the researcher to test emergent theory with constructs that can be readily measured and hypotheses that can be proven false (Eisenhardt, 1989). In addition, since the theory-building process is so intimately tied with evidence it is more likely that the emerging theory will be consistent with empirical observation (Eisenhardt, 1989)

3.4 Socio economic profiles of visited locations:

This section will display the socio economic profiles of the visited locations: Taruna Jaya, Pilang, Jabirin and Buntoi. The section will start with a socio economic profile of the main capital of Central-Kalimantan: Palangkaraya. This is due to the fact that the policy decisions (interviews held with the government departments: high institutional level) made in Palangkaraya will affect the visited remote locations. Map 2 provides a schematic representation of the visited locations.

Map. 2



Palangkaraya:

The main economic activity in the area of Palangkaraya can be found in coal-mining (16,25%), finance (12,82%) and services (9,26%) (Field research Palangkaraya, 2012). Furthermore it can be stated that the unemployment rate is about 6.64% (of the 2.2million population). Since the population of Central-Kalimantan is scattered all over the lands and by times concentrated in larger cities it will serve as no surprise that the degree to which villagers need diesel/ gasoline and electricity varies per region. In the more developed area (Palangkaraya) people have access to electricity, however in the more underdeveloped areas the access to electricity and the supply is limited and poorly arranged (Field research Palangkarya, 2012): the four visited remote villages illustrate this. Regarding local economic development it must be mentioned that the government of Palangkaraya works with a regional program called PM2L: Program of development and maintenance of the village. PM2L attempts to focus on the needs of the inhabitants in different villages and provides various forms of support (including micro credit) to stimulate the local economy.

Taruna Jaya:

Concerning the four visited remote villages, the small village of Taruna Jaya was without a doubt the most remote and difficult to access location (Field research Taruna Jaya, 2012). The village of Taruna Jaya has roughly 300 inhabitants and lies approximately 23.5 km south of Palangkaraya and employs around 25 independently employed rubber farmers. In addition the main economic activity is fishing; nearly 80% of all the villagers are employed as fisherman, whereas only 10% are rubber farmers, 5% civil servants and the remaining 5% shop holders. The head of village mentioned that the village does employ besides the mentioned farmers, shop holders and fishermen some other entrepreneurs, however the amount is very limited (1-2 people). With regard to the smallholder rubber farmers it can be stated that they go as often as they can to their plantations to tap the rubber (approximately 3 times a week). The size of the plantations and with that the amount of earnings varies heavily between the rubber farmers: between 30.000 rupiah (about 2,50 euro a day) and 100.000 rupiah a day (Field Research Taruna Jaya). Additionally it can be stated that the rubber farmers pay about 7.000 Rupiah per litre of fuel and need around 2-3 litres a day to operate their electricity generator, machines or motorcycle. (Field research Taruna Jaya, 2012). The main practiced religion in Taruna Jaya is Muslim (70%) followed by Christian (25%) and a Hindu minority (5%). Recently, no projects or plans have been carried out or initiated to support local economic development of Taruna Jaya (Field research Taruna Jaya, 2012). The main socio economic

problem of Taruna Jaya is twofold: low access to energy and electricity and a low level of income (Field research Taruna Jaya, 2012).

Pilang:

The second visited village concerns the small village of Pilang around 500 inhabitants; located about 35 km south of Palangkaraya. Pilang can be characterized as a rubber village since around 80% of all the villagers are employed as independent smallholder rubber farmers (Field research Pilang, 2012). It is therefore not surprising that the main economic activity in Pilang is the rubber industry. The remaining 20% of the villagers are employed as either small shop holders or civil servants. In addition, the secretary of the head of village mentioned that no other entrepreneurs are active in Pilang. Regarding the smallholder rubber farmers it can be stated that the frequency of visiting the plantation various greatly between the rubber farmers; from daily to once a month (Field research Pilang, 2012). In addition, the earnings of the rubber farmers differs substantially and ranches from 70.000 (Small plantation) Rupiah to 550.000 rupiah a day (large plantation). Next to this the smallholder rubber farmers pay approximately 7.000 rupiah per litre for fuel and use between 0-11 litres a day to operate generators, machines or boats (Field research Pilang). Additionally, the majority of the villagers are Muslim, whereas only a small part is either Hindu or Christian. Concerning local economic development it can be stated that Pilang focuses on developing more plantations and agriculture, however not a lot of government funding is available to realize these projects and plans (Field research Pilang, 2012). Since Pilang does have access to electricity the main socio economic problem can be found in villagers having a low level of income.

Jabirin:

The third visited village concerns the village of Jabirin which is located approximately 50 km south of Palangkaraya. The town is relatively large compared to the other two villages and has around 770 inhabitants. From the villagers around 80% is employed in the rubber industry and the remaining 20% is either civil servant, small shop holder and or fisherman (Field research Jabirin, 2012). It is interesting to note that just as in the other villages many villagers do have one or more jobs to make a living and increase their level of income. The secretary of the head of village in addition mentioned that there are about 2 other entrepreneurs in Jabirin which provide the community with repair services for motorcycles. Concerning the smallholder rubber farmers it can be stated that they go to the rubber plantation about 3 to 5

times a week to collect the rubber and clean the plantation. The smallholder rubber farmers make about 80.000 to 250.000 rupiah a day when they visit the rubber plantation (Field research Pilang, 2012). In order to operate the motorcycles and boats the smallholder rubber farmers use between 2 and 8 litres a day for about 7.000 rupiah a litre. Currently no plans with regard to local economic development have been initiated by the government, companies or NGO's. The secretary of the head of village however emphasized that some projects were carried out in Jabirin in 2011 concerning the irrigation and infrastructure sector. The main socio economic problem of Jabirin can be found in the fact that the villagers have a very low level of income and as a result a low standard of living.

Buntoi:

The village of Buntoi is located around 60 km south of Palangkaraya and is substantially larger than the previous visited villages; illustrated by its 2694 villagers. The main economic activity can be found in the rubber industry which employs around 80% of the villagers (Field research Buntoi, 2012). The remaining 20% is employed as either civil servant or owner of a small shop. Regarding the smallholder rubber farmers it can be stated that they visit the rubber plantation ranging from once a week to every day. Furthermore the smallholder rubber farmers earn between 100.000 and 300.000 a day (10 ha). Next to this the prices paid for gasoline vary between 7.000 and 8.000 rupiah; the rubber farmers need between 1 and 5 litres a day to operate their motorcycle, boat or machines (Field research Buntoi, 2012). Although the main religion is still Muslim (60%) a relatively large amount of the villagers (compared to the other villages) is Christian (30%), with only 10% being Hindu. Buntoi employs in addition around 5 other entrepreneurs which mainly operate as rubber collector. Regarding local economic development it can be stated that the village of Buntoi has many projects stimulating development (Field research Buntoi, 2012):

- Construction of a new road in 2012 (paid by the government: 130.000.000 Rupiah)
- Project (house of society) focusing on providing help to the elderly people of buntoi in 2012
- Building two kindergartens in 2010 (paid by the government)
- Projects focusing on generating clean drinking water in 2010
- Project: institution of villagers (opportunity to save and receive money, in the form of micro credit: initiated and paid by the government, 70.000.000 Rupiah)

The main socio economic problem faced by the village of Buntoi lies in the low standard of living and low level of income of the villagers.

3.5 Data gathering process

Since the previous paragraphs related the factors of both model 1 and 2 to the empirical reality, provided the main research strategy and presented the socio economic profiles of the researched locations it is of importance to go into more detail with regard to the way in which data for this study was gathered. It is for this reason that this paragraph will focus on the data gathering process of this study.

One of the virtues of qualitative research is that there are many alternative sources of data. The researcher can for example use interviews, observations, documents, videos, drawings, diaries, memoirs, newspapers, biographies, historical documents and other sources not listed here (Corbin & Strauss, 2008). This study will use various types of data gathering regarding the same problem, such as combining interviewing with observation, and adding documents for the purpose of verifying or adding another source of data (Corbin & Strauss, 2008). Table 2 displays a small summary containing the multi-method approach which was used in this study.

Table 1.

Multi- Method data collection approach	
Stage 1	▪ Collecting secondary data sources concerning local economic development and the relating factors ▪ Interview sessions with Kloekhorst (interview, 2012) and Abduh (interview, 2012) to gain a deeper understanding of the MBD project regarding the technical side.
Stage 2	▪ Interviews with experts (professors, PHD students and MBA students) at Institut Teknologi Bandung (ITB) concerning local economic development, technology push, franchising, entrepreneurship and the MBD project
Stage 3	▪ Data collection in the area of Central Kalimantan visiting the main capital Palangkaraya and the remote villages of Taruna Jaya, Pilang, Jabirin and Buntoi. ▪ Interviews with different stakeholder of the MBD project. Two levels: institutional level (departments, head of district, head of villages) and community level (the smallholder rubber farmers). ▪ Observations of how the people work, and getting an understanding of what is going on
Stage 4	▪ Reflection of data collected in Central-Kalimantan with the experts from ITB Bandung

Stage 1 focused on getting an understanding of the MBD project and the different concepts involved. Stage 2 provided a more in depth Indonesian perspective with regard to the MBD project, local economic development and franchising. Therefore multiple experts (Interview sessions with 4 professors, 2 PhD students and 2 MBA students) were interviewed at Institut Teknologi Bandung (ITB). Before entering the third stage of the multi-method data collection approach a brochure was developed based on the insights gathered from both stage 1 and

stage 2. This brochure both translated in English and Indonesian proved to be a key element for successfully interviewing the local communities and communicating the main message of the MBD project (7.2 appendix, brochure MBD project). The section which focuses on the recommendation will go into further detail with regard to brochure and the developed franchising model for the remote village in particular. The third stage of the multi method data collection approach was probably the most challenging since data had to be collected in the area of Central and South Kalimantan, where multiple interviews with different stakeholders involved in the MBD project provided insights with regard to the feasibility of the MBD project, franchising and local economic development. It can be stated that during my field visits in Kalimantan 62 people were interviewed at both institutional and community level. Since this study mainly focused on the smallholder rubber farmers in the remote villages (community level) it serves as no surprise the largest amount of interviews were held at community level, resulting in 55 interviews. Additionally, 4 interviews were held with the head of villages (Taruna Jaya, Pilang, Jabirin and Buntoi) at low institutional level, 1 interview was held with the head of the entire district (middle institutional level) and 2 interviews were held with officials from government of Palangkaraya departments focusing on local economic development and plantation. Stage 4 was of relevance since it reflected with the experts of ITB upon the time spent and interviews held in Central Kalimanta. Using these qualitative ways of collecting data has of course next to the benefits of obtaining a large amount of data its limitations. Qualitative methods are often perceived as being subjective since it is hard to generalize findings (Hulme, 2007). In order to mitigate the subjectivity it is according to (Eisenhardt & Graebner, 2007) vital to use various and highly knowledgeable informants who view the subject matter from diverse perspectives.

4. Empirical results of field research in Central-Kalimantan

This section will display the empirical results of the field research in Central-Kalimantan concerning fives cases: the area of Palangkaraya (government departments and head of district: high and middle institutional level) and the remote villages Taruna Jaya, Pilang, Jabirin and Buntoi. The section will be divided into three paragraphs which will focus on providing insights with regard to the previously introduced models 1 and 2 which examine the feasibility of a technology push and examine whether the main theoretical argument of this study holds. The empirical results of model 1 are split into technology push (A) and Franchising (B) whereas model 2 displays the results concerning entrepreneurship and the main theoretical argument. The first paragraph will display the results concerning the factor technology push (A) and will indicate whether to the opinion of the respected levels (high, middle and low institutional level and community level) the feasibility of a technology (push) can be described as either high or low. The second paragraph will display the results concerning franchising (B) and the preference of social or commercial franchising concerning to the opinion of the respected levels. The last paragraph will focus on the results regarding the factor entrepreneurship and the main theoretical argument of this study, and indicate whether a technology push carried out by a franchising model could have a positive, negative or no effect on entrepreneurship in the region concerning.

4.1 Results technology push:

This paragraph will provide the results of the high, middle and low institutional levels and community level concerning technology push. Table 2 will provide an overview of all the results.

High institutional level: Both the department of plantation and the department of local economic development mentioned their support for the technology push. This indicates ***a high feasibility*** of carrying out the technology push project. According to the department of plantation it can be stated that the MBD technology push will empower the economy of the smallholder farmer, whereas the department of local economic development emphasized that in order to overcome local resistance it will be vital to work with the different local cultures and levels of education (Field research Palangkaraya, 2012). Both departments in addition mentioned that support in the form of a subsidy or favourable policy can be provided by the government of Palangkaraya (Field research Palangkarya, 2012).

Middle institutional level: The head of the district supports the MBD technology push since many people in the area of Palangkaraya work in the rubber industry. The MBD technology push provides in his view a function to the rubber seeds and stimulates local economic development. This illustrates ***a high feasibility*** of carrying out the technology push project. Additionally, the head of district stated that this technology push project will be the first to be conducted in this area with regard to renewable energy and the rubber seeds. Not many projects have been carried out in this region due to the fact that the main government of Jakarta has other priorities (Field research Palangkaraya, 2012). The head of district believes that the governor will in addition support the technology push by potentially increasing the land of the rubber plantations and other favourable measures.

Low institutional level:

(1) Taruna Jaya: With regard to the mobile bio diesel project and the resulting technology push it can be stated that the head of village of Taruna Jaya was enthusiastic about the project and was willing to participate. This indicates ***a high feasibility*** of implementing a technology push in the region. Next to this, the head of village believed that: "The project could definitiely work here, since the villagers are eager to learn" (Field research Taruna Jaya, 2012). Since no technology push project or projects concerning local economic development have been carried out in this region, this project could alter the current situation and stimulate economic development of Taruna Jaya (Field research Taruna Jaya, 2012). In order to provide the project with the needed support it can be stated that a favourable policy or subsidy will be supported by the head of village.

(2) *Pilang:* Regarding the technology push MBD project it can be stated that the secretary of the head of village reacted positively and was eager to mention his support for the project. This illustrates a ***high feasibility*** of carrying out the technology push. Additionally, the secretary of the head of village in addition believed that the MBD technology push project could provide Pilang with additional job and growth opportunities (Field research Pilang, 2012). Moreover the secretary of the head of village mentioned the unique opportunity to add value to the normally disregarded rubber seeds. It can be stated that the village of Pilang never experienced any kind of project which aimed at increasing the level of local economic development by a technology push. The MBD project could therefore provide Pilang with an interesting and unique opportunity according to the secretary of the head of village. Although the secretary of the head of village supports the technology push, it was mentioned that

due to bad experiences with a corrupted government (government gave them bad instead of good seeds), there exists a trust issue between the villagers and the government (Field research Pilang, 2012).

(3) *Jabirin:* The secretary of the head of village of Jabirin reacted positively with regard to the MBD technology push project and was willing to participate. This points to a ***high feasibility*** of implementing a technology push project. Additionally, the secretary of the head of village mentioned that the usage of biofuel could be an interesting alternative to gasoline since the prices of fossil fuels keep rising (Field research Jabirin, 2012). In addition it was mentioned that an attempt to transform all the rubber plantations into palmoil plantations was opposed and blocked by the community (villagers believed that more could be earned through rubber plantations).

(4) Buntoi: The MBD technology push project was positively received by the head of village of Buntoi. The head of village would like to participate with regard to this technology push since it will serve three objectives: 1) it will create job opportunities and with that increase the standard of living, 2) it will serve as an alternative for fossil fuels and 3) it will provide function to useless seeds (Field research Buntoi, 2012). The previous statements indicated a ***high feasibility*** of carrying out a technology push project. The remote village of Buntoi has some experiences with projects carried out in their region (see socio economic profile Buntoi: 3.4), however Buntoi does not possess experience with regard to renewable energy. It is for this reason that the head of village emphasized the need to educate the community in order for the technology push to be a success: "people should know what they are working with". Next to this the head of village mentioned that support would be provided concerning favourable policies or subsidies.

Community level:

(1) *Taruna Jaya:* The smallholder rubbers farmers do not or marginally use the rubber seeds; this provides an interesting opportunity for the MBD technology push project: by turning the rubber seeds into bio fuel the MBD project will provide value to the rubber seeds that are currently regarded as waste products. All the interviewed rubber farmers reacted positively to the project and were willing to participate (Field research Taruna Jaya, 2012). This clearly illustrates a ***high feasibility*** of carrying out the technology push project. Additionally, people argued that the technology push would provide them with additional job opportunities and with that extra money for the community. In addition it was mentioned that the seeds could now be more efficiently

used: useless becomes useful. Furthermore the rubber farmers argued that this technology push could push the community towards a higher standard of living.

(2) *Pilang:* The smallholder rubber farmers reacted positively with regard to the MBD technology push project, indicating a ***high feasibility*** of carrying out the technology push project. Next to this, the farmers mentioned that by adding value to the rubber seeds, it would be possible to create jobs and with that increase the level of income (Field research Pilang, 2012). A majority of the rubber farmers in addition mentioned that the community of Pilang was once approached by a Palm oil company which wanted to buy the rubber plantations. The rubber farmers refused since they believed that more could be earned with the rubber. This particular case example indicates the willingness of the villagers to get ahead and look at the long term instead of accepting short term cash by random palm oil plantation companies (Field research Pilang, 2012).

(3) *Jabirin:* Since almost all the seeds are regarded as being useless, the technology push MBD project could provide Jabirin with the opportunity to use the seeds and add value. It is for this reason that all the farmers in Jabirin support the technology push and are willing to participate. This indicates a ***high feasibility*** of implementing a technology push project. Additionally the rubber farmers argue that the MBD technology push project could provide Jabirin with job opportunities and push the region economically and technically ahead and with that create the potential of increasing the standard of living for many people (Field research Jabirin, 2012).

(4) *Buntoi:* Since all the smallholder rubber farmers throw away the rubber seeds, the technology push project was positively received by all the rubber farmers. The smallholder rubber farmers argued that the technology push could provide a function to the rubber seeds and with that create additional jobs for the smallholder rubber farmers. The smallholder rubber famers are all eager to participate since the technology push could stimulate the level of income and local economic development (Field research Buntoi, 2012). This indicates a ***high feasibility*** of implementing a technology push project in this village.

Table 2.

Empirical results model 1: technology push (A)										
	Institutional level:						Community level:			
	high institutional level	middle institutional level	low institutional level							
			Taruna Jaya	Pilang	Jabirin	Buntoi	Taruna Jaya	Pilang	Jabirin	Buntoi
technology push (A)	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*

4.2 Results Franchising:

This paragraph will commence by providing the results of high, middle and low institutional level and community level. In the end the results will be displayed in the schematic feasibility testing matrix to provide a summarized overview see table 3.

High institutional level: The departments of local economic development and plantation supported the technology push project carried out by a franchising model. This is due to the fact that the smallholder rubber farmers will be enabled through franchising to receive learning and coaching and this will push the general level of knowledge in the communities ahead. This positive response indicates ***a high feasibility*** of carrying out a technology push by a franchising model. Next to this it can be stated that providing the smallholder rubber farmers with training and coaching will in addition be vital for the sustainability of the project and its success. The department of local economic development added that with regard to the training a good combination between theory and practice will be vital (Field research Palangkarya, 2012). Furthermore the creation of local ownership through the franchising model will stimulate the sustainability of the project and will thus be of vital importance. Owning the technology locally will enable the smallholder rubber farmers to benefit for a longer period from the technology and existing knowledge. Concerning the implementation of the technology push by a franchising model it can be stated that both departments (high institutional level) did not mind whether or not a future franchisor was a national, local or foreign company, as long as the company/ organization has good intentions, cares for the people and create job opportunities. This indicates a preference for ***social franchising*** since an emphasis is put on carrying for the people and providing job opportunities.

Middle institutional level: Since it is the job of the government to support the people and increase the standard of living it is no surprise that the head of district supported the technology push carried out by a franchising model. The franchising model would according to the Head of district provide a breakthrough in the region. The head of district emphasized the usefulness and importance of the project due to its ability to provide unused rubber seeds with a function, educate the smallholder farmers with training and coaching, and stimulate local economic development by creating additional job opportunities. This indicates a preference for ***social franchising*** due to the focus on the rubber farmers and providing them with additional job opportunities. Furthermore the head of district mentioned that the franchising model of the technology push could help in stimulating sustainable development by creating local ownership and with that assuring that the technology of the technology push project and the knowledge spill-over effects would stay in the region. All these statements by the head of district point to a ***high feasibility*** of carrying out the technology push by a franchising model. With regard to the implementation of the technology push project carried out by a franchising model it can be stated that the head of district preferred to have a local franchisor instead of a national or international company or organisation, however the head of district is aware of the fact that not many organizations or companies locally do exist which are willing to participate.

Low institutional level:

(1) Taruna Jaya: The head of village supported the possibility of implementing the MBD technology push project by a franchising model. This franchising model could according to the head of village definitely be suitable for Taruna Jaya since the rubber farmers and villagers are eager to learn and get ahead. This indicates a ***high feasibility*** of carrying out the technology push by a franchising model. Next to this, providing training and coaching by the franchisor will be a must for the successful implementation of the project; this is due to the low educational background of the smallholder farmers (Field research Taruna Jaya, 2012). Regarding the implementation of the technology push, the head of village mentioned that a local company carrying out the technology push would be the most preferable option. However "as long as the community can learn and benefit from the resulting impact of the technology push, any company carrying out the project would be supported, as long as it delivers (Field research Taruna Jaya, 2012)."Furthermore it was mentioned

that the company or organisation acting as franchisor should according to the head of village focus on creating social value: caring for the people and providing them with jobs, instead of solely focusing on the commercial goals of the organisation. This clearly points to a preference for a adopting a ***social franchising model***. Additionally it was mentioned that creating local ownership by the franchising model would be essential for establishing sustainable local economic development in Taruna Jaya. This is due to the fact that the head of village believed that if the community will be able to own equipment / technology push, a large portion of the wealth will remain in the region (Field research Taruna Jaya, 2012).

(2) *Pilang:* The technology push project carried out by a franchising model was positively received by the secretary of the head of village. It was mentioned that the franchising model provided an interesting and possibly effective approach to stimulate local economic development. This indicates a **high feasibility** of carrying out a technology push by a franchising model. Concerning the implementation of the MBD technology push project it can be stated that a foreign organisation or company as franchisor would be the preferred option according to the head of village. This is due to the fact that local or national companies/ organisations will not be believed by the majority of the villagers: government characterized by corruption (Field research Pilang, 2012). Furthermore, the head of village argued that by adopting the franchising model and with that stimulating the creation of local ownership, technology and knowledge would remain in Pilang and provide the village with an additional advantage. The secretary of the head of village emphasized that the main aim of the project should lie in taking care of the villagers, instead of exploiting the situation (palm oil companies). This statement points to a preference for ***social franchising*** opposed to commercial franchising. Furthermore the secretary of the head of village argued that a franchisor which provides training and coaching would be essential for fruitful continuation of the project (Field research Pilang, 2012).

(3) *Jabirin:* The secretary of the head of village reacted positively with regard to the MBD technology push being carried out by a franchising model. This indicates ***a high feasibility*** of implementing a technology push by a franchising model. The secretary was however not certain about whether or not the villagers would want to work with a franchising model, since the palm oil company was already rejected. The secretary of the head of village additionally stated that the franchising model should provide the smallholder rubber farmer with training and coaching to master the technology,

otherwise the technology push carried out by a franchising model would not succeed in Jabirin. Next to this the Head of village argued that the creation of local ownership through the franchising model would be vital for sustainable development, since the technology would be locally owned and used. Additionally, the head of village argued that locally owning the technology push project would stimulate smallholder rubber farmers to take up responsibility and keep participating in the project. Concerning the implementation of the technology push MBD project, the secretary of the head of village mentioned that a local company carrying out the project would have the preference. This is due to the fact that a local company would speak the language, know the Dayak culture and know the people (Field research Jabirin, 2012). Furthermore, the franchisor should according to the secretary of the head of village focus on caring for the people and with that create social value instead of just focusing on profit while neglecting the needs of the villagers. This points to a preference for ***social franchising*** instead of commercial franchising to carry out a technology push.

(4) Buntoi: The head of village of Buntoi supported a franchising model to carry out the MBD technology push, indicating a ***high feasibility*** of implementing a technology push project by a franchising model. The franchising model was supported due to the fact that the head of village believed that franchising provided a simple and direct business model as opposed to current affairs which involved a too powerful middleman (Field research Buntoi, 2012). Concerning the implementation of the technology push it can be stated that the head of village did not have a particular preference with regard to the franchisor: "it could be a local, national or international company, as long as the company provides the villagers with a function (Field research Buntoi, 2012)." Furthermore the head of village argued that a potential franchisor should care for the people and focus on their biggest needs; providing them with an opportunity to increase their level of income in a structural way, indicating a preference for ***social franchising***. Previous palm oil companies did exactly the opposite; they gave the villagers short term money, however no jobs and with that no income was provided (Field research Buntoi, 2012). Additionally, the head of village mentioned that the creation of local ownership will be very important for the community; the technology will remain in the area and the smallholder rubber farmers can continually benefit from the training and coaching which will push Buntoi further ahead.

Community level:

(1) Taruna Jaya: All the smallholder farmers in Taruna Jaya supported a franchising model; the majority of the rubber farmers did not really care what kind of company, organizations (international, national, local) would become the franchisor, as long as the company had good intentions, was trustful and provided job opportunities for the community so that an increase in the standard of living could be realized. Furthermore some of the rubber farmers emphasized the need for a company to focus on generating social value where others would rather see a company/ organization which would focus on commercial ends and creating profit. This clearly points to a ***high feasibility*** of implementing a technology push carried out by a franchising model, however ***no clear preference is given with regard to either adopting a commercial or social franchising model***. Additionally the majority of the rubber farmers mentioned that creating local ownership of the technology push by a franchising model would be of vital importance for the community: the farmers believed that the entire community would benefit from the additional coaching and training since the MBD project would provide opportunities for spill-over effects of knowledge and know-how in Taruna Jaya (Field research Taruna Jaya, 2012).

(2) Pilang: All the smallholder rubber farmers of Pilang positively reacted with regard to the MBD technology push project being carried out by a franchising model. This indicates a ***high feasibility*** of carrying out a technology push by a franchising model. However a few rubber farmers did mention that if a fee would be charged for making use of the equipment it would be very hard for them to participate since they already barely make a living. With regard to the franchisor it can be stated that the rubber farmers did not really care whether or not the company was national or international, as long as the project would not be executed by the government (the rubber farmers kept emphasizing the corrupted government). In addition and with regard to the franchisor the smallholder rubber farmers clearly mentioned the preference for a company or organisation which would stimulate the creation of job opportunities and care for them instead of only focusing on profit (Field research Pilang, 2012). This clearly indicates a preference for ***social franchising***. Moreover the smallholder rubber farmers believed that by creating local ownership due to the franchising model it would be possible to push the region ahead through the continual usage of new technology and knowledge, supported by coaching and training.

(3) *Jabirin:* Regarding the MBD technology push project being carried out by a franchising model it can be stated that all the smallholder rubber farmers supported it and are eager to get ahead. This illustrates a ***high feasibility*** of carrying out a technology push by a franchising model. Additionally the majority of the smallholder farmers did not care whether the franchisor was European, local, national or foreign as long as jobs are created. A minority of smallholder farmers were in favour of a European franchisor due to the fact that the Indonesian local and national government are characterized by corruption (Field research Jabirin, 2012). Additionally the smallholder rubber farmers stated that the franchisor should focus on generating jobs and care for the smallholder farmers instead of exploiting the lands and focusing on profits (Field research Jabirin, 2012). This indicates a preference for ***social franchising***. Next to this, a majority of the rubber farmers mentioned that locally owning the technology due to the franchising would be very important; due to continual knowledge spill-over from technology, training and coaching.

(4) *Buntoi:* All the smallholder rubber farmers of Buntoi were in favour of adopting a franchising model to carry out the technology push, indicating a ***high feasibility*** of using a franchising model to carry out a technology push; some of the rubber farmers preferred a Western franchisor, whereas some other rubber farmers supported a possible local franchisor. The rest of the rubber farmers (large group) did not really care about whether the future franchisor was local, national or western; as long as the company/ organization has good intentions and cares for the people (Field research Buntoi, 2012), indicating a preference for ***social franchising***. Furthermore the smallholder farmers adopted a long term perspective and argued that the potential franchisor should focus on providing job opportunities and knowledge instead of short term plantation buy-outs and focusing on the financial bottom line. The smallholder farmers in addition stated that a franchising model and the creation of local ownership would be vital for the sustainable development of the region. The smallholder rubber farmers argued that technology supports sustainable knowledge, and that with the creation of local ownership knowledge and technology will be able to have a structural effect on the community (Field research Buntoi, 2012).

Table 3

Empirical results model 1: franchising (B)										
	institutional level:						Community level:			
	high institutional level	middle institutional level	low institutional level							
			Taruna Jaya	Pilang	Jabirin	Buntoi	Taruna Jaya	Pilang	Jabirin	Buntoi
franchising (B)	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*	*high feasibility*
preference social or commerical franchising:	*social franchising*	*social franchising*	*social franchising*	*social franchising*	*social franchising*	*social franchising*	*Can be both social and commercial franchising*	*social franchising*	*social franchising*	*social franchising*

4.3 Results Entrepreneurship:

This paragraph will commence by providing the results of high, middle and low institutional level and community level. In the end the results will be displayed in the schematic feasibility testing matrix to provide a summarized overview of all inputs table 4.

High institutional level: Both departments stated that a ***positive influence*** on entrepreneurship in the area of Palangkaraya could be created due to the technology push MBD project and the franchising model. Both departments placed a great emphasis on the fact that the local villagers must be educated in order to successfully implement a technology push and create knowledge-spill-overs which could eventually lead to more entrepreneurial activities in the area of Palangkaraya.

Middle institutional level: The head of district believed that a technology push carried out by a franchising model could have a ***positive influence*** on entrepreneurship in the region of Palangkaraya: "it will change the way of thinking, people will become more entrepreneurially minded and become aware of the fact that useless materials could become valuable (Field research Palangkaraya, 2012).

Low institutional level:

(1) Taruna Jaya: The head of village believed that the technology push MBD project carried out by a franchising model will result in a ***positive influence*** on entrepreneurship in Taruna Jaya. This is due to the fact that additional learning opportunities provided by the franchising model due to coaching and teaching will

create knowledge spill over effects on the community and will provide an incentive for the villagers to start for example their own business. In order to create these so-called knowledge spill-over effects it was according to the head of village of vital importance to realize that the community is poorly educated, so the training and coaching provided by the franchising model should be adapted to the level of education of the community: they need to understand it, before they can work with it (Field research Taruna Jaya, 2012).

(2) Pilang: The technology push project carried out by a franchising model will according to the secretary of the head of village not result in additional entrepreneurial activities carried out by the smallholder rubber farmers. There will according to the secretary of the head of village be ***no influence on entrepreneurship***. The secretary of the head of village on the other hand does believe that the creation of jobs due to the MBD project could result in a higher standard of living.

(3) *Jabirin:* the technology push MBD project carried out by a franchising model could according to the secretary of the head of village have a ***positive influence*** and result in more entrepreneurial activities by the smallholder rubber farmers in the community. This is due to the fact that the smallholder rubber farmers will most likely get inspired by the training and coaching to start thinking about starting a business or seeing things differently: "from useless seeds to useful seeds, could be an eye-opener."

(4) Buntoi: The head of village believed that entrepreneurship in Buntoi could be stimulated by the adoption and implementation of the MBD technology push project carried out by a franchising model. The Head of village argued that at the moment only a few people were entrepreneurially minded; this project could inspire people to think outside the box and start an own business due to the additional knowledge and continuous training provided by a franchising model.

Community level:

(1) Taruna Jaya: The village of Taruna Jaya does not necessarily have a lot of other entrepreneurs active in the region, however almost all the smallholder rubber farmers have next to being a rubber farmer, additional jobs to maintain and increase their income. Many smallholder rubber farmers are additionally employed as fishermen or small shop owners. All the smallholder rubber farmers believe that the technology push MBD project carried out by a franchising model, which

focuses on training and coaching will provide them with learning opportunities and knowledge benefits which will ***positively influence*** their ability to start their own business (Field research Taruna Jaya, 2012). Next to the head of village, the smallholder rubber farmers clearly mentioned that the effect on entrepreneurship and local economic development will only be marginal if the franchisor does not provide them with training and coaching. The rubber farmers suggested that in order for the projected to be successful and result in a stimulation of entrepreneurship and local economic development it would be necessary to provide the community with continued training. Additionally a small majority of the smallholder rubber farmers mentioned that if they would become entrepreneurs they would like to do it together and work together, whereas a minority of the rubber farmers in Taruna Jaya would prefer to do it alone and keep the benefit for themselves (Field research Taruna Jaya, 2012).

(2) *Pilang:* Since most of the villagers are employed as smallholder rubber farmers, it serves as no surprise that no other entrepreneurs are active in Pilang. However, all the smallholder farmers believed that the MBD technology push project carried out by a franchising model could ***positively influence*** and stimulate entrepreneurship in Pilang. Some smallholder farmers argued that the training and coaching would influence their way of thinking; their mindset would become more entrepreneurial (Field research). The smallholder rubber farmers furthermore argued that if they would start their own businesses and become more entrepreneurial, team work would be the key: the farmers would like to work together and share experiences instead of setting up a business by themselves. Moreover some rubber farmers mentioned that people are competitive, so in order to successfully implement a franchising model competitive groups could be created (Field research Pilang, 2012).

(3) *Jabirin:* The smallholder farmers believe that the technology of the MBD project carried out by a franchising model could result in more entrepreneurial activities in Jabirin and thus have a ***positive influence*** on entrepreneurship. The smallholder rubber farmers emphasized that training and coaching will result in more local knowledge and will enable them to create new jobs by themselves when a new business is started. The smallholder rubber farmers preferred to work together and be able to share opportunities and challenges with other farmers instead of starting a new business by themselves. Additionally, working together with other

smallholder rubber farmers would provide them with the needed competition to stay motivated (Field research Jabirin, 2012).

(4) *Buntoi:* The smallholder farmers believed that the MBD technology push project carried out by a franchising model could have a ***positive influence*** and result in more entrepreneurial minded villagers and as a result more entrepreneurial activities in Buntoi (Field research Buntoi, 2012). The smallholder rubber farmers mentioned that the training and coaching provided by the franchising model will enable them to use the gained knowledge to start an own business and develop the region economically. The rubber farmers which will participate in the MBD technology push project will according to the smallholder rubber farmers be able to serve as an knowledge extension: "they will use their knowledge to teach family members and friends and with that create knowledge-spillover effects throughout the entire community." Additionally the rubber farmers argued that possible future entrepreneurial activities such as starting a new business will be carried out by working together with other rubber farmers. The smallholder rubber farmers preferred to work together because by doing that they will be able to share and learn from each other and more efficiently solve challenges and grab opportunities (Field research Buntoi, 2012).

Table 4

Empirical results model 2: Entrepreneurship										
Technology push (A) carried out by franchising model (B) influences entrepreneurship	institutional level:						Community level:			
	high institutional level	middle institutional level	low institutional level							
			Taruna Jaya	Pilang	Jabirin	Buntoi	Taruna Jaya	Pilang	Jabirin	Buntoi
	postive influence	*positive influence*	*positive influence*	*no influence*	*positive influence*	*postive influence*	*positive influence*	*positive influence*	*positive influence*	*positive influence*

5. Discussion

5.1 Discussion of the empirical results:

Overall it can be stated that the presented empirical results (4. Empirical results of field research in Central-Kalimantan) are relatively strong and provide convincing insights. It should however be noted that a small remark can be made with regard to the displayed empirical results in table 2, 3 and 4 concerning the levels of analysis, in particular the institutional level. It can be stated that the results concerning high and middle institutional level, which are obtained from government departments and the head of district should be handled with care from an empirical point of view. This is due to the fact that a limited amount of people were interviewed concerning these specific levels. Both levels (high and middle institutional level) are included in this study since they provide interesting insights and content which is in line with the other views (low institutional and community level) and contribute to a more complete understanding of the situation in Central-Kalimantan.

This section will discuss the main empirical results of the fieldwork carried out in Indonesia, it will be interesting to discuss the findings concerning the technology push (table 2), franchising (table 3) and the effect on entrepreneurship (table 4) and with that on local economic development. Firstly, the empirical results concerning the different institutional levels (including the government departments, the head of district and the four remote villages) and community level (four villages) with regard to the technology push will be discussed. Secondly, the main empirical results regarding franchising will be discussed and analyzed. Thirdly and lastly, the empirical results regarding entrepreneurship will be discussed.

With regard to the *results of the technology push* (table 2) it can be stated that at both institutional and community level the feasibility of carrying out a technology push was high. All the government departments (high institutional level), the head of district (middle institutional level), the head of villages of Taruna Jaya, Pilang, Jabirin and Buntoi supported the technology push. All levels of analysis pointed to the usefulness of the project and the potential to stimulate local economic development by creating additional jobs for the rubber smallholder farmers (community level) in the remote villages.

Concerning the *empirical franchising results* (table 3) it can be argued that both levels of analysis (institutional level and community level) indicate a high feasibility of carrying out the technology push by a franchising model. At the community level all smallholder rubber farmers (Taruna Jaya, Pilang, Jabirin and Buntoi) supported a franchising model since the technology would have an impact on the development of the region for years to come due to the organizational structure (local ownership) of franchising. Next to this, all the head of villages of Taruna Jaya, Pilang, Jabirin and Buntoi believed that the franchising model could stimulate the structural use of technology and the resulting knowledge-spillover effect due to the local ownership of the technology push. Additionally the high and middle institutional levels clearly emphasized the importance of training and coaching in order to increase the level of knowledge in the local communities and with that local economic development. Basically it can be stated that almost all levels indicated a preference for adopting a franchising system with social franchising elements. Both insights from institutional levels and community level pointed to the need of caring for the smallholder farmers and creating social value by stimulating the local economy by creating jobs and providing coaching and training. At community level however, the smallholder rubber farmers were divided with regard to both social and commercial franchising. Some smallholder rubber farmers preferred a franchising model which focused on generating profit whereas others believed that creating social value and caring for the people should be the most important aim.

With regard to *entrepreneurship* (table 4) and whether a technology push carried out by a franchising model could have an effect on entrepreneurship and with that on local economic development the following can be said: all levels of analysis believed that a positive influence existed between a technology push carried out by a franchising model on entrepreneurship. A nice illustration concerning the positive influence on entrepreneurship can for example be found in the reasoning of the head of village of Jabirin who stated that the smallholder rubber farmers will most likely get inspired by the training and coaching to start thinking about starting a business or seeing things differently: “from useless seeds to useful seeds, could be an eye-opener.” Only the secretary of the head of village (low institutional level) did not believe that such a link existed.

In conclusion and with regard to the empirical findings of this study it can be stated that the technology push is highly feasible, a technology push carried out by a franchising model is highly feasible, the results point to a preference for a business model focused on social

franchising and a technology push carried out by a franchising model could have a positive influence on entrepreneurship in remote areas in developing countries. Only at community level the people in the village of Taruna Jaya did not have a preference for either social or commercial franchising and at low institutional level the secretary of the head of village stated that there is no influence of a technology push carried out by a franchising model on entrepreneurship in the village.

5.2 Discussion of the research questions

The previous section provided a discussion regarding the main empirical results of this study. The attention will now be directed to discussing the sub research-questions of this research which are guided by the main research question which focused on : *What kind of ownership variety (commercial or social franchising would be best in introducing technology push to stimulate entrepreneurship and with that local economic development in remote areas in developing countries?* The sub- research questions of this study will be discussed by providing both theoretical and empirical insights.

1. *What does the literature say about the linkages between technology push, franchising, entrepreneurship and local economic development?*

The literature provided interesting insights with regard to the various possible theoretical linkages between technology push, franchising, entrepreneurship and local economic development. The work of Solow (1957), Stewart (1978), Rees (1979) and Malecki (1983) point to a theoretical link between technology push and local economic development. This is illustrated by for example Malecki (1983) who argued that the technology factor is a prime driver in the regional economic development process. One way to stimulate local economic development and alleviate socio economic problems in multiple locations is the development of franchising models to implement technologies (push) and scale it up (a technology push carried out by a franchising model). Additional theoretical linkages including franchising can be found in the reasoning of Choy and Goh (1997) and Alias (1994) who both link franchising with (local) economic development. Furthermore, Choy and Goh (1997), Chong (1994) and Sorenson and Sorenson (2001) mention a link between franchising and entrepreneurship. Chong (1994) for example argued that franchising can be viewed as a tool for stimulating entrepreneurship. Next to linkages between technology push, local economic development, franchising and entrepreneurship, some authors have established a theoretical connection

between entrepreneurship and local economic development. The Worldbank (2005), Birch (1987) and Longbao (2009) for example emphasize the importance of entrepreneurship in the development of local economies. In conclusion it can be stated that multiple linkages between technology (push), franchising, entrepreneurship and local economic development are evident and theoretically supported by multiple authors.

2. *What does the literature say about commercial and social franchising and what is the theoretical difference between the two franchising approaches?*

This study differentiated between commercial and social franchising as forms of ownership to introduce a technology push in remote villages in developing countries. Regarding commercial franchising it can be stated that: a typical (commercial) franchising model was introduced by Henriques and Nelson (1997), argumentation was provided stating that a franchising model can foster rapid growth and provide the desired stimulus for developing localities (Henriques and Nelson, 1997). The scholars Henriques and Nelson (1997), Astley (1984), Astley and Van de Ven (1983), Hawley, Dandridge et al (1993), Alon, Alpeza & Erceg (2007) and Parivodic (2003) focussed in their studies on franchising and mentioned several benefits and drawbacks of using a commercial franchising model. Next to commercial franchising this study focused on social franchising.

Regarding social franchising it can be stated that the main theoretical and empirical contributions come from research of multiple disciplines ranging from education to healthcare. The scholars Ruster, Yamamoto and Rogo (2003) and Mongatu (2002) provided the literature with various (social) franchising structures used in for example the health care sector. Additionally academic work from Beck, Deelder and Miller (2010), Piggot (2004) and Meuter (2008) provided various opportunities and challenges when using a social franchising model. Concerning the theoretical difference between commercial and social franchising it can be said that the essential theoretical\ difference lies in the mission of both approaches. Whereas commercial franchising focuses on generating profit for the stakeholders involved, social franchising concentrates on creating social value for the local communities and involved stakeholders.

3. *Are the smallholder rubber farmers (community level) and the institutions (institutional level) ready for a technology push carried out by a franchising model and do both levels support the MBD project?*

The empirical data collected during the field visits in Central-Kalimantan points to a readiness on community level (Palangkaraya, Taruna Jaya, Pilang, Jabirin and Buntoi) and also on low, middle and high institutional level to participate in the MBD project. This is indicated by the high feasibility of implementing a technology push and by the high feasibility of carrying out the technology push by a franchising model. Given this it can be concluded that the smallholder farmers, head of villages, head of district and the officials at both government departments are ready for a technology push project like the MBD project. This empirical result is highly interesting given the previously mentioned (introduction) statement that the people in remote locations in Central-Kalimantan are resistant to change according to Baars (2010) and van Kammen (2010) and people from the MBD research group (Interview, 2012).

4. *Which ownership variety: commercial or social franchising received the most empirical support on both community and institutional level?*

The most empirical support by both community and institutional level (low, middle and high institutional level) was received for the social franchising approach rather than the commercial franchising approach. This is due to the fact that both community and institutional level preferred a franchising approach which provided jobs and cared for the people in the localities rather than an approach which solely focused on generating profit. All the villages supported a social franchising model except the remote village of Taruna Jaya. The smallholder rubber farmers (community level) of this village preferred a normal commercial franchising model, due to the opportunities of earning more money (profit). Considering the empirical inputs from both levels of analysis and the visited localities, it can be stated that a franchising approach with social elements would be the most suitable and preferred option by the majority of the stakeholders to be carried out in the visited region of Central-Kalimantan.

5. *Do the empirical findings (table 4) on both community level (smallholder rubber farmers) and institutional level support the main theoretical argument that a technology push carried out by a franchising model stimulates entrepreneurship?*

It can be stated that the theoretically developed model (model 2) examining the main theoretical argument was empirically supported. During the field trips in Central-Kalimantan it became clear that both institutional level (low, middle and high) and community level (smallholder rubber farmers in Taruna Jaya, Pilang, Jabirin and Buntoi) believed that a

technology push project such as the MBD project carried out by a franchising model could stimulate entrepreneurship and create entrepreneurial activities in the rural communities of Central-Kalimantan and with that stimulate local economic development. Only the secretary of the head of village in Pilang (low institutional level) did not believe that a technology push carried out by a franchising model could stimulate entrepreneurship.

Now that all the sub-research questions have been discussed it becomes evident that theoretical links between technology push, franchising, entrepreneurship and local economic development are highly likely to exist. Furthermore, theoretically it can be stated that both commercial franchising and social franchising have advantages and disadvantages when in use. Additionally it can be said that a commercial franchising approach is already fully developed both theoretically and empirically as a proven business concept in developed countries, whereas a social franchising approach has yet to be fully developed. However the social franchising approach does have as opposed to commercial franchising useful and relevant practical experience in developing countries. Regarding the literature, it can in addition be stated that no clear favourite franchising approach emerged. Empirically however, it can be stated that the majority of the stakeholders involved on both levels of analysis supported a technology push carried out by a franchising model with a preference for a franchising approach with social elements. Considering both theoretical and empirical insights, this study opts for using a combination of both commercial and social franchising to stimulate entrepreneurship and with that local economic development in remote areas in developing countries. This combined approach with a franchising basis and social franchising elements can be theoretically referred to as a *hybrid franchising approach*. The conclusion will further elaborate upon the implications of practically using a hybrid franchising approach in Central-Kalimantan to stimulate local economic development.

6. Conclusion

The previous section focused on providing insights with regard to the sub-research questions of this research. This section will commence with providing concluding remarks concerning this study. Next, based on the conclusion and the gathered theoretical and empirical insights a recommendation for scholars, practitioners and stakeholders involved in local economic development will be provided. Additionally this section will include the limitations of this study and possibilities for future research.

This study aimed to contribute to the Mobile Bio Diesel project carried out in Indonesia and in particular the Local Economic Resource Development (LERD) program, as part of the MBD project. This study focused throughout the research on examining the feasibility of introducing a technology push in Central-Kalimantan by a franchising model (commercial or social franchising) to stimulate entrepreneurship and with that local economic development in remote villages in developing countries. The point of departure to examine this feasibility can be found in the model developed by Stimson (2009) which focused on creating sustainable local economic development. Although relevant and interesting, the model of Stimson (2009) did provide opportunities for further research since some crucial factors for the economic development of localities were neglected. This study believed that a technology (push) should be included in the process reaching sustainable local economic development. This study in particular focused on the importance of the ownership of technology to stimulate entrepreneurship and with that local economic development. The concept of franchising was introduced as a type of ownership of a technology (push) due to its ability to serve as a tool for rapid growth and possibly alleviate socio economic problems (BRAC and the Grameen Bank). It is for these reasons that this study was guided by the main theoretical argument (fig 2) which stated that a technology push should be carried out by a franchising model (social or commercial franchising) in order to stimulate entrepreneurship and result in sustainable local economic development of remote locations in developing countries.

This study first turned its attention to establishing theoretical linkages between technology push, franchising (social and commercial franchising) entrepreneurship and local economic development to strengthen the main theoretical argument of this study. From the literature it became evident that the linkages between technology push, franchising, entrepreneurship and local economic development existed. Additionally insights were provided concerning the

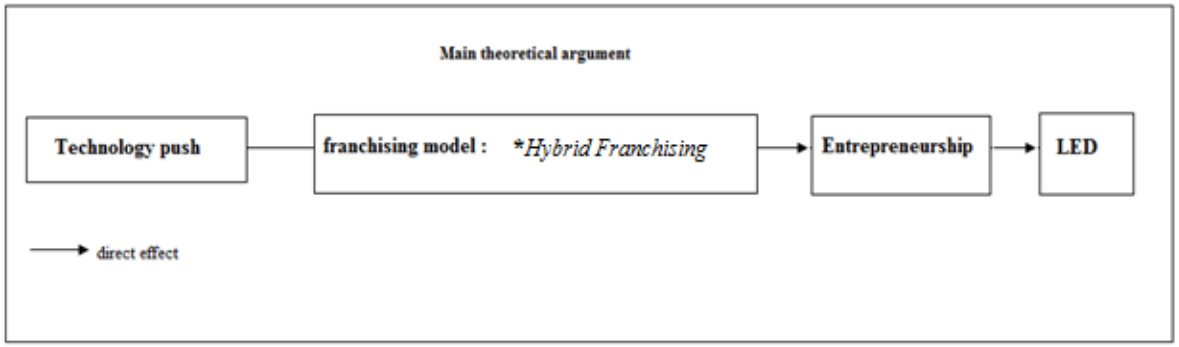
technology push, franchising, entrepreneurship and local economic development. This study concluded the literature review by arguing that both a social and commercial franchising approach could be used in introducing a technology push in developing countries.

In order to support the main theoretical argument of this thesis and analyzing the feasibility of introducing a technology push it proved to be necessary to develop two models. Model 1 was developed to empirically examine the feasibility of introducing a technology push and Model 2 was developed to examine the main theoretical argument of this thesis. The empirical support confirming the main theoretical argument and the feasibility of introducing a technology push was gathered in the Ex-Mega-Rice-Project area, focusing on the capital of Central-Kalimantan: Palangkaraya and the remote localities of Taruna Jaya, Pilang, Jabirin and Buntoi. The findings pointed to a high feasibility of carrying out a technology push on both community and institutional level (low, middle and high institutional level). Additionally, both community and institutional level supported a technology push carried out by a franchising model. Regarding a franchising approach, the majority of both community and institutional level preferred a franchising approach with social franchising elements, instead of a franchising model solely focusing on generating profit. Only the remote village of Taruna Jaya did not prefer a social franchising approach, this is due to the fact that some rubber smallholder farmers wanted to focus on profit. Next to this, the majority of the empirical findings on both community and institutional level confirmed that a technology push carried out by a franchising model could stimulate entrepreneurship in local economies. Only the secretary of the head of village of Pilang did not believe that a technology push carried out by a franchising model could stimulate entrepreneurship in their remote village.

To conclude it can be stated that this study found theoretical and empirical evidence which supports the main theoretical argument that a technology push carried out by a franchising model (social or commercial franchising) can stimulate entrepreneurship and with that local economic development. The empirical evidence (community and institutional level) additionally pointed to a high feasibility of introducing a technology push in Central-Kalimantan by a social franchising model. Given the empirical preference for a social franchising model and the theoretical preference for either a commercial or social franchising approach, this study believes that the combination of both approaches will yield the most impact and possibly alleviate faced socio economic problems in remote locations in developing countries. This integrated approach can be referred to as a hybrid franchising

approach, which combines the elements of both commercial and social franchising to serve people in remote locations in developing countries. Fig 6 provides the main theoretical argument which incorporates both the theoretical and empirical evidence by including hybrid franchising as an approach to introduce a technology push to stimulate entrepreneurship and with that LED in remote locations in developing countries.

Fig. 6



Additionally it can be stated that next to the empirically and theoretically confirmed argument concerning fig 6, this study in addition developed a practical hybrid franchising model which shows (section 6.1) how a technology push should be practically introduced by a hybrid franchising model to stimulate entrepreneurship and LED in remote locations in developing countries (Central-Kalimantan, Indonesia).

6.1 recommendations

Based on theoretical and empirical insights, this study concluded that a combination of both commercial and social franchising would be best to introduce a technology push to stimulate entrepreneurship and with that local economic development in remote localities in developing countries. This combination of using both commercial and social franchising elements can be referred to as hybrid franchising. This section proposes and recommends a potential practical hybrid franchising model which could be implemented with regard to the Mobile Bio Diesel project in Central-Kalimantan, based on the gathered theoretical and empirical insights. The aim of this practical hybrid franchising model is to fit the rural environment in developing countries and with that possibly alleviate the faced socio economic problems of smallholder rubber farmers in Central-Kalimantan such as a low standard of living and energy scarcity.

6.1.1 Practical Hybrid Franchising Model

Figure 7

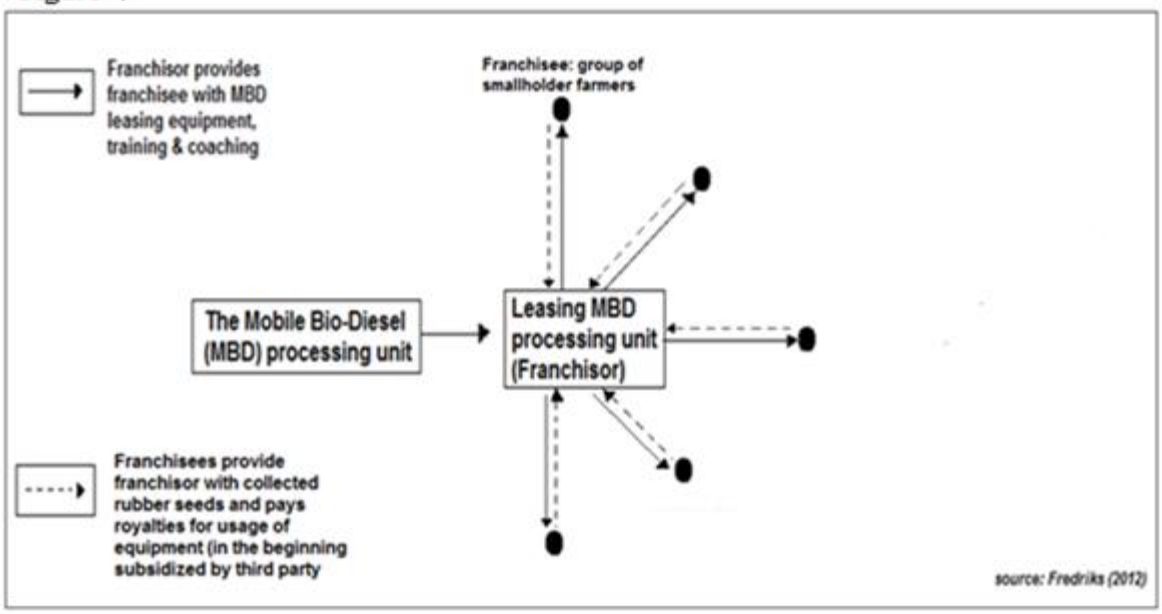


Figure 7 provides a schematic representation of a practical hybrid franchising model. The hybrid franchising model will be able to stimulate local economic development by introducing the Mobile Bio Diesel processing unit technology to the remote localities. This Mobile Bio Diesel processing unit provides the remote villages with the opportunity to optimally use their waste products (rubber nuts) and turn them into bio-diesel and as a result create job opportunities for the smallholder rubber farmers.

Franchisees:

Regarding figure 7, it can be stated that the mobile bio diesel processing unit technology will be moved from one remote village to another for a certain period of time. The MBD processing unit will be leased to potential interested smallholder rubber farmers which will act as franchisees in the involved local villages. The interested smallholder rubber farmers can only use the MBD processing unit if they are willing to participate in the MBD project and become franchisee. By doing so, the smallholder rubber farmer will partly own the MBD processing unit technology and this will as a result create some local ownership in the region. The practical hybrid franchising model is organised in this way since the stimulation of local ownership will enable smallholder rubber farmers to benefit from the technology for a prolonged period of time. This will then result in sustainable local economic development of the remote localities. Additionally the potential franchisees (interested smallholder rubber farmers) will feel more responsibility to work with the technology since they partly own it.

As a franchisee, the interested smallholder rubber farmers will need to collect their waste products (the rubber nuts) and provide these to the franchisor. An additional duty of the franchisees can be found in paying a small royalty to the franchisor as an exchange for using the MBD processing unit technology. Some interviewed farmers however mentioned that the requirement to pay a fee to a franchisor would be very hard for them since the smallholder rubber farmers already face difficulties in sustaining themselves. It is for this reason that in the start-up phase of the MBD project carried out by the potential practical hybrid franchising model, no fee will be charged to the franchisees. The royalties will in the beginning be financed by for example a third party involved in the project (until the smallholder rubber farmers will be able to pay a small fee for using the technology).

Figure 7 shows that the potential franchisees are organized in groups; this is due to the fact that the smallholder rubber farmers preferred to work together. This will enable them to work and own the equipment together and by doing so stimulate their local economy.

The practical hybrid franchising model provides interesting benefits for the franchisees which can be seen in table 5.

Table 5

Advantages of practical hybrid franchising model for franchisees:	
1.	Additional income from selling the biodiesel
2.	Additional source of bio-diesel for own usage
3.	Become partly owner (franchisee) and reap the benefits of additional learning, coaching and training: ability to stimulate entrepreneurial activities and local economic development
4.	No fees/ royalties are charged in the start up phase of the MBD project
5.	Potential electricity

Franchisor:

The practical hybrid franchising model included the empirical data from both community level and institutional level (including low, middle and high institutional level) and insights from professors Siswanto, Simatupang and Manununrng (interview, 2012) who emphasized that a potential franchising model in the region of Central-Kalimantan should include a franchisor which really cares for the smallholder rubber farmers (potential franchisees) and fit

the rural area. The usage of the practical hybrid franchising model will obligate the franchisor to provide the franchisees with right to use the MBD processing unit technology, training and coaching. This will serve two ends: on the one hand the franchisor will be assured of the fact that the equipment will be handled properly and on the other hand the level of knowledge of the smallholder rubber farmers will potentially increase and lead to more entrepreneurship. Advantages for potential franchisors can be seen in table 6.

Table 6

Advantages of practical hybrid franchising model for franchisor	
1.	Use the land of the Ex-Mega-Rice-Project (EMRP area) in a sustainable way
2.	Get insights with doing business and creating social value in developing countries
3.	Explore the local market in Central-Kalimantan
4.	Apply if successful the practical hybrid franchising model elsewhere to reach maximum growth potential

6.2 implications

The previous section provided a specific recommendation in the form of a practical hybrid franchising model; this section will discuss the Implications of this thesis for scholars, practitioners and stakeholders involved in the MBD project.

Previous studies concerning local economic development and the LERD programme of the MBD project found a resistance to change by local communities in the area of the EMRP-area (van Kammen, 2010; Baars, 2010). This study clearly points to exactly the opposite by providing empirical evidence which suggests that people on both community and institutional level want to change and want to participate in the MBD technology push project. This is indicated by a high feasibility of a technology push and a high feasibility of a technology push carried out by a franchising model by both community and institutional level. Given this, it can be stated that people living in remote local economies and policymakers at the government departments in Palangkaraya Central-Kalimantan want to change and further develop themselves. This empirical finding has positive implications for the stakeholders involved in the MBD project since there is support from both community and institutional level for the implementation of a technology push carried out by a franchising model to stimulate entrepreneurship and with that local economic development.

This study additionally has implications for practitioners and scholars interested in local economic development due to the introduced theoretical alternative matrix to examine the feasibility of implanting a technology push. Scholars and practitioners should according to this study be aware of the potential influence of technology (push) on local economic development and its relation with entrepreneurship if being carried out by a franchising model. Especially the work of Stimson (2009) focusing on endogenous growth models to stimulate sustainable local economic development will be improved by not neglecting the importance of technology (push) and its effect on local economic development.

6.3 limitations

Some remarks with regard to limitations faced by this study. Firstly, since this study used multiple case-studies (Capital Central-Kalimantan: Palangkaraya, remote locations: Taruna Jaya, Pilang, Jabirin and Buntoi) to gather the empirical data in a qualitative way, it serves as no surprise that the ability of this study to generalize the findings to other remote locations in developing countries is hard. It could very well be that the gathered data of the multiple case studies is too narrow to draw conclusions from on all remote rural localities in developing countries. It is for this reason that the results serve as propositions and could be used and tested in quantitative studies which focus on larger samples in rural localities in developing countries.

Secondly, this study is limited to two levels of analysis: institutional and community. The initial aim was to include enterprise level as well (palm oil companies), however the inclusion of the enterprise level as level of analysis proved to be challenging because of access difficulties. Apparently, the Indonesian palm oil companies are not keen on inviting researchers to discuss a technology push and their potential involvement. This is unfortunate since an inclusion of the enterprise level could have additionally enriched the research and provided an extra view with regard to the Mobile Bio Diesel project.
Next to this and regarding the levels of analysis it can be said that a limitation can be found in the amount of interviewees who were interviewed at middle institutional level. Only one interviewee (the head of the district) was interviewed.

Thirdly and lastly, a limitation which should not be neglected is the language barrier for both the researcher and the interviewees. Since the ability of the researcher to communicate in Bahasa Indonesia and the ability of the interviews to communicate in English was limited,

using a translator was the logical choice. The usage of a translator could however have compromised the richness of the data from the original data source.

6.4 Future research

This study provides various avenues for future research. Since this qualitative study is limited to a few cases in the area of Central-Kalimantan it will be interesting to examine the feasibility of introducing a technology push in more cases to increase the reliability of the results and provide additional richness to the data. This can for example be achieved to include various other areas of the Ex-Mega-Rice-Project in the analysis, or even carrying out the research in other rural areas in developing countries. Next to this, additional levels of analysis such as for example the enterprise level could be included in the analysis to add to the richness of the data. Next to this a previous study of van Kammen (2010) concerning the Mobile Bio Diesel project and the area of Central-Kalimantan concluded that the localities were resistant to change, whereas this study found empirical evidence from local farmers and institutions stating a willingness to participate and change the current situation, triggers future research. Another avenue for future research could be found in researching the practical usability of the suggested (recommendation) practical hybrid franchising model, especially with regard to making the model sustainable by for example focusing on the financial side (micro credit).

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Appendices

7.1 Interview Questions:

Questions Smallholder Farmers (community level) : (MAIN FOCUS)

Situation assessment:

1. What do you do every day as a farmer on your land?
2. Are you working independently or are you employed by a company/ government?
3. Are there people in this village who have their own business?
4. If you have been employed by a company/ government how did they treat you?
5. Did they take care of you? Provide training, coaching?
6. Did you think that you received a fair pay?
7. How much do you earn?
8. What is the main socio economic problem in this area?

Technology push Dimension:

Tell the interviewee about the project (clearly mention benefits)

1. how much do you pay now for fuel?
2. How much would you need?
3. What are you using the diesel for? Generating electricity? Driving car?
4. What are you using your waste products for right now?
5. What do you think of the MBD project? (since it will add value to your current waste products)
6. Would you like to use it, given the benefits of the project?
7. Have you been asked to join a project like this before/ or a project initiated by the local government? If so, what worked, what did not work? What would you suggest for improvement?

Franchising dimension:

Tell about project involving franchising

1. If you participate would you prefer having a company (Indonesian, European, Asian) or local government as franchisor (owner) or a hybrid form?
2. What do you think is more important; profit? Or creating jobs for the people in your village?
3. Do you think that it is important that the local community (farmers) locally own the introduced technology push (such as the MBD project)?

Entrepreneurship dimension:

1. Do you think that you will benefit from the training and coaching? Do you see yourself employing other entrepreneurial activities?
2. If you would carry out additional entrepreneurial activities, would you do it by yourself or would you prefer to work with multiple farmers?
3. Do you have other jobs, a small shop or something?

Questions institutional level (low, middle and high)

Situation assessment:

1. What is the main economic activity in this area?
2. How high is the employment rate?
3. Are there many entrepreneurs in this region?
4. Do the people have sufficient access to diesel/ gasoline/ electricity? (Is there a need for this project?)
5. What are the plans at the moment with regard to local economic development in this region?
6. What is the most common type of ownership with regard to rubber industry / Jatropha? (cooperation)
7. What is the main socio economic problem?

Technology push dimension:

Tell the interviewee about the MBD project

1. What do you think about the MBD project?
2. Have there been more projects like this is this region? What are the reasons that they worked or failed according to you? How could this be improvement?
3. Do you see a role for the local government? (subsidy, policy ?)
4. Could the local government participate with a company? Advising role? Has the local government worked before with companies?
5. Would you prefer a foreign or local/ national company carrying out this project?
   - *Will a palm oil company come to your region, what do you think about this? (Do you think that the farmers will sell their land?, how to prevent this?)*

Franchising dimension:

1. What do you think about the MBD project being carried out by a franchising model? Could this work in this region? Are there examples of franchising in this area?
2. Do you think that creating local ownership is important for sustainable development?
3. Do you think that providing training to the farmers (by the franchisor) is important for the success of the project?
   - *Would you prefer the project to focus on generating profit or generating social value and creating jobs in this region?*

Entrepreneurship Dimension:

1. Do you think that this MBD project will have an effect on the entrepreneurial activities in this region?
2. Do you think that local farmers will be more likely due to the learning and coaching of the franchisor to start additional entrepreneurial activities?

General: where do you advise us to go next? Which farmers to vist, are their any companies (palm oil or something) which can be visited?

7.2 How to practically introduce a franchising model in remote areas in developing countries: brochure MBD project

This section introduces a brochure which can be very helpful to practically introduce a franchising model to remote locations in developing countries. By guiding the interviewees through the brochure and clearly explaining what is meant by for example the project and franchising, the knowledge asymmetry is reduced. This enables the interviewees to provide a better answer since they 'know' something concerning the specific subject. This section provides the brochure used in this research in both English and Bahasa Indonesia.

The Mobile Bio Diesel Project

university of groningen

Jan Fredriks Master Student IB&M
University of Groningen

Content MBD Project

the development of local/community-scale biodiesel industry and waste products in Central/South Kalimantan:

- Stimulate the local economy and particularly local agricultural activities by introducing a new bio industry focused on waste products
- Prevent further degradation of the environment and particularly that of sensitive peatlands
- Stimulate the transition of Indonesia into a bio-based economy
- Reduce the Indonesian dependency of fossil resources like crude oil

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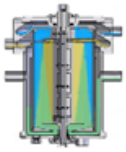
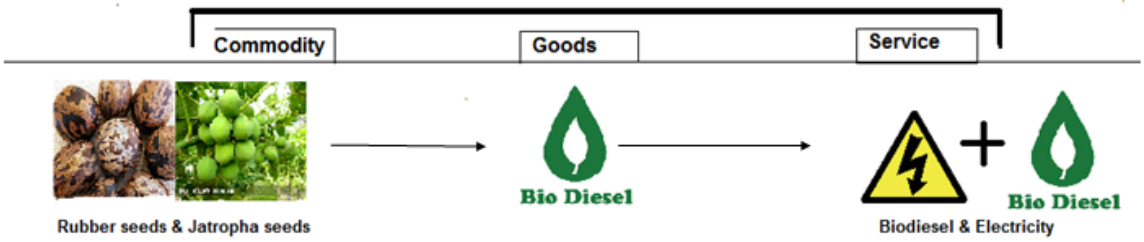
Mobile Bio-diesel processing unit (the concept)
SEE ADDITIONAL INFORMATION (last page)



Process influenced by Mobile Bio-Diesel processing unit



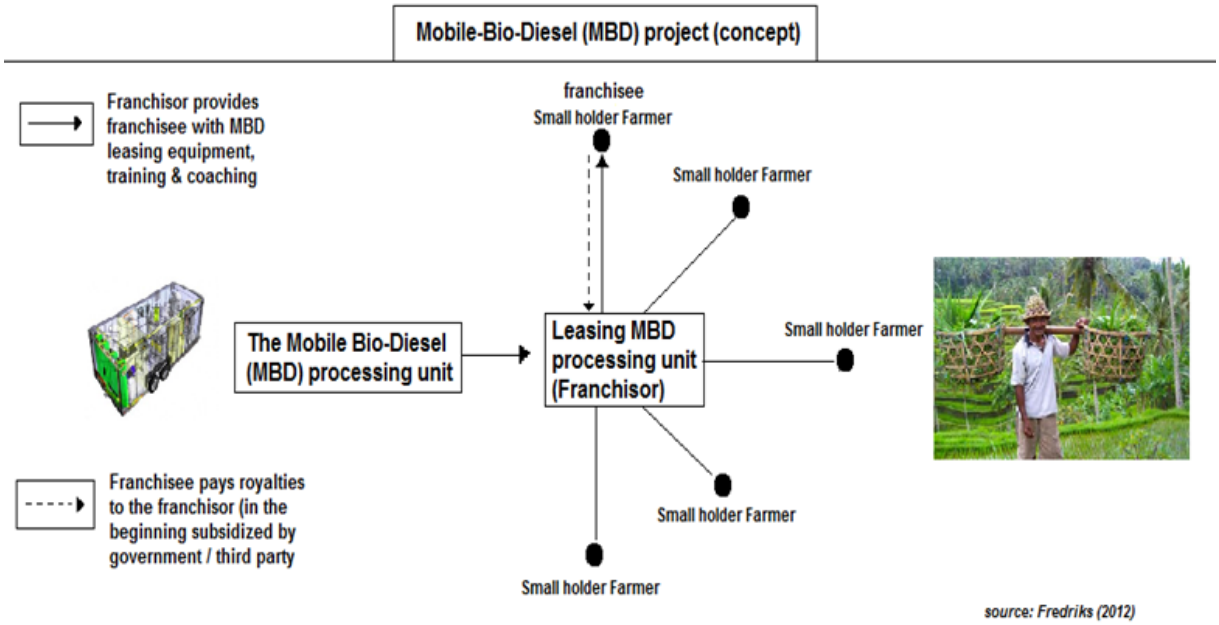
Mobile Bio-Diesel processing unit: Jatropha seed vs Rubbers seed

Rubber Seed:

- Estimated productivity of Rubber seed: **300- 500 kg / ha / year**
- Yield of Rubber Seed oil: **41% wt**

Jatropha Seed:

- Estimated productivity of Jatropha seed: **1-4 ton/ ha / year**
- Yield of Jatropha seed oil: **56%**



Benefits for Smallholder farmers:

- Additional income from selling the bio-diesel (waste products → mobile processing unit → bio-diesel)
- Additional source of bio-diesel for own usage
- Become partly owner (franchisee) and reap the benefits of additional learning, coaching and training: stimulate entrepreneurial activities
- In the beginning no additional costs involved
- Provide electricity

What do they need to do:

- Grow either rubber seed/ Jatropha seed and separate waste (waste products will be used in MBD processing unit)
- Open to benefit from franchising model

Benefits for Local Government

- Create the opportunity for people to learn from franchising and start their own business (entrepreneurial behaviour)
- attract more funding from additional third parties or national government if project is being carried out successfully
- use the land of the Ex-Mega-Rice-Project (EMRP area)
- Create job opportunities for local community
- Create additional wealth for the community
- provide villagers with a cheaper alternative to fossil fuel
- provide electricity

What do they need to do?

- Invest in the project / become partly/ wholly franchisor

Benefits Company

- Franchising model provides the opportunity for expanding quickly to other areas
- Benefit from the growth potential of the bio industry business
- Sell biodiesel
- Get to know the local market
- If successful receive additional government funding

What do they need to do?

- Invest in the project and become franchisor
- Provide training, coaching to local smallholder farmers

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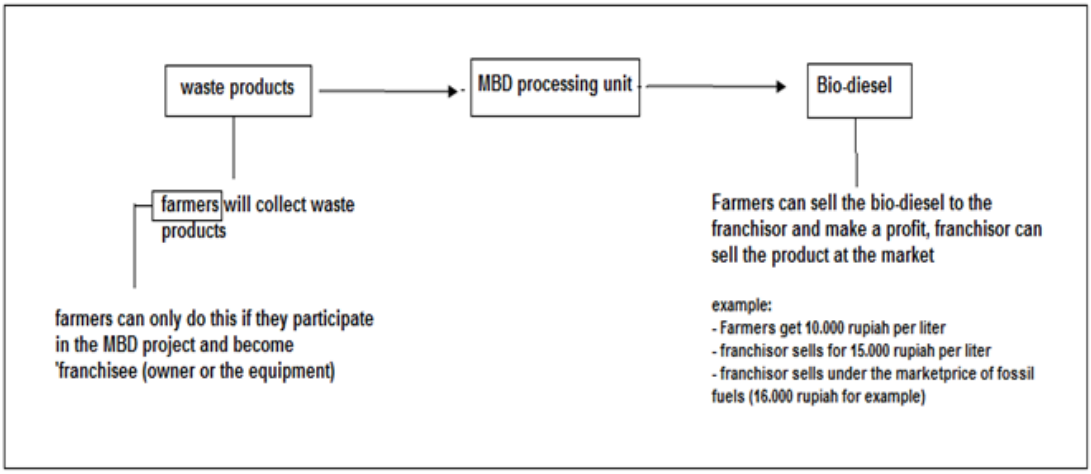
Additional:



Bahasa Indonesia (MBD project)

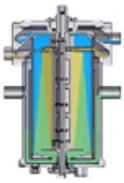
university of groningen

Penjelasan mengenai MBD (*Mobile Bio Diesel Project*)

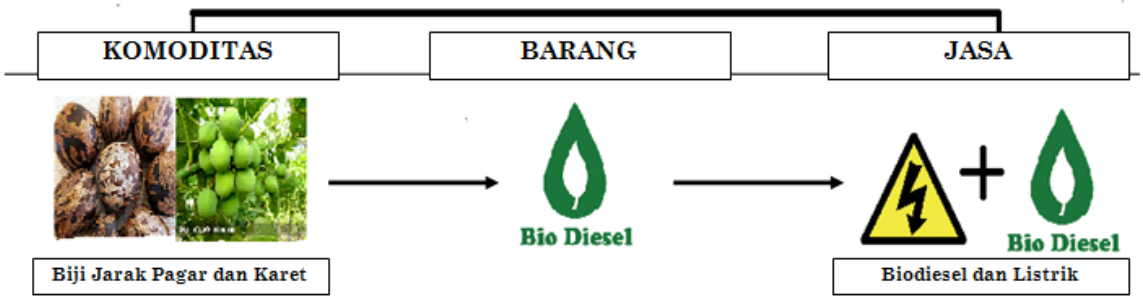
Salah satu proyek untuk mengembangkan industri biodiesel berskala lokal/komunitas dan pemanfaatan limbah dari biji tanaman jarak pagar (Jatropha) ataupun karet. Usulan lokasi proyek ini adalah di Kalimantan Tengah/Selatan. Tujuan proyek:

1. **Menstimulasi perekonomian lokal**, secara khusus aktivitas agrikultur lokal dengan cara memperkenalkan konsep bioindustri yang baru dan terfokus pada produk limbah
2. **Mencengah perusakan lingkungan** lebih lanjut, terutama terhadap lahan gambut yang sensitif
3. Menstimulasi transisi perekonomian Indonesia menjadi **perekonomian yang berbasiskan sumber daya hayati** (*bio-based economy*)
4. **Mengurangi ketergantungan terhadap bahan bakar fosil**, contohnya minyak mentah.

Satuan Pengolahan 'Mobile Bio-diesel' (Konsep)



Process influenced by Mobile Bio-Diesel processing unit



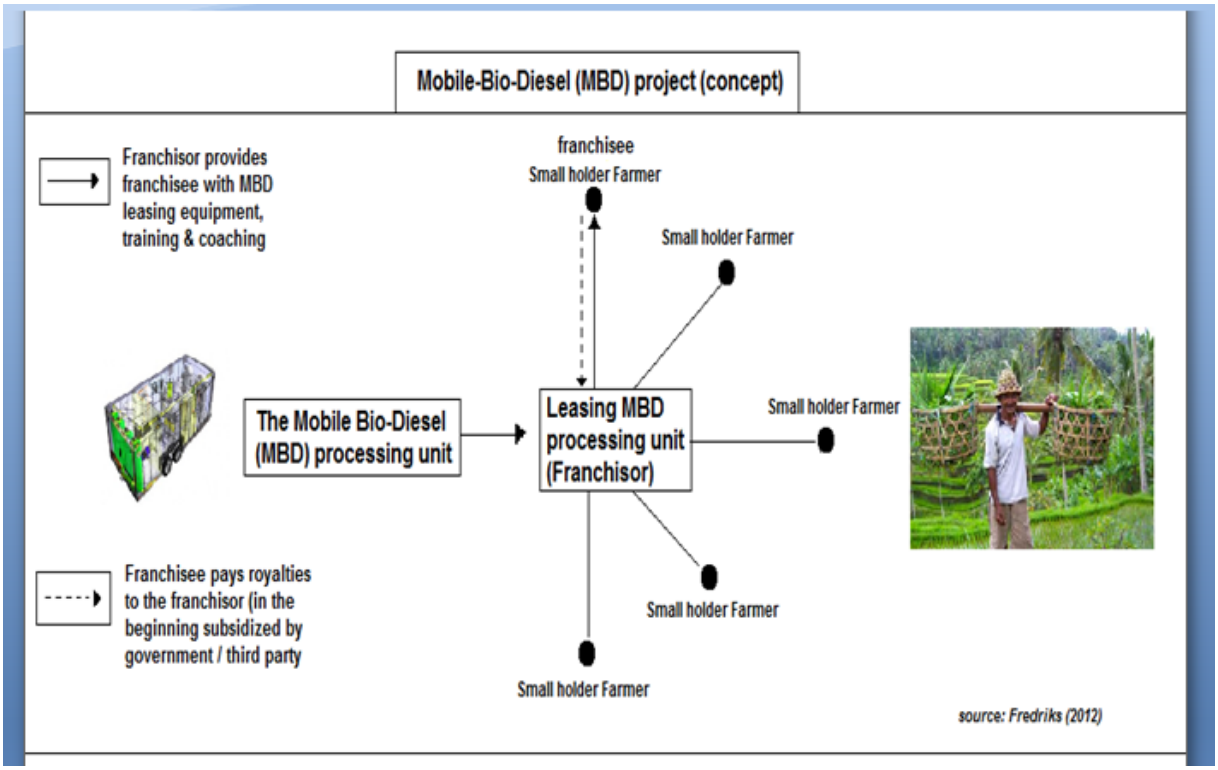
Satuan Pengolahan 'Mobile Bio-Diesel': Biji Jarak Pagar (Jatropha) vs Biji Karet

Biji Karet:

- Perkiraan produktivitas karet: **300- 500 kg / hektar / tahun**
- Persentase minyak biji karet: **41% / berat**

Biji Jarak Pagar:

- Perkiraan produktivitas karet: **1-4 ton / hektar / tahun**
- Persentase minyak biji jarak pagar: **56% / berat**



Keuntungan bagi Petani:

- Tambahan penghasilan dari hasil penjualan (limbah → unit proses keliling (truk) → bio-diesel)
- Tambahan biodiesel untuk digunakan sendiri
- Menjadi pemilik bagian waralaba (*franchisee*)
- Memperoleh keuntungan dari pembelajaran, penyuluhan, dan pelatihan: mendorong kegiatan kewirausahaan
- Tidak ada keharusan membayar pada awalnya
- Dapat menyediakan listrik

Apa saja yang harus dilakukan:

- Menanam karet atau jarak pagar, dan memisahkan limbahnya (karena akan digunakan dalam satuan pengolahan biodiesel)
- Memiliki hak dalam keuntungan (sebagai *franchisee*)

Keuntungan bagi Pemerintah Lokal:

- Menciptakan kesempatan bagi masyarakat untuk belajar tentang bisnis usaha waralaba (*franchising*) dan memulai usaha sendiri (wirausaha)
- Kesempatan untuk memperoleh pendanaan lebih lanjut dari pihak ketiga atau pemerintah nasional (jika proyek tersebut berhasil)
- Menggunakan lahan bekas Mega-Rice-Project (EMRP area)
- Menciptakan lapangan pekerjaan bagi komunitas lokal
- Meningkatkan kesejahteraan bagi masyarakat daerah
- Menyediakan kesempatan bagi penduduk desa untuk mendapatkan bahan bakar alternatif
- Menyediakan listrik di desa-desa tersebut

Apa yang perlu dilakukan?

- Menanamkan investasi pada proyek/atau menjadi pihak pemilik waralaba (franchisor), apakah pemilik sebagian atau seluruh waralaba

Keuntungan bagi Perusahaan:

- Model usaha waralaba ini menyediakan kesempatan untuk berekspansi dalam waktu singkat ke daerah lain
- Keuntungan dari pertumbuhan bisnis berbasis hayati
- Dapat menjual biodiesel
- Dapat mengenal pasar lokal
- Jika proyek berhasil, ada kesempatan untuk memperoleh pendanaan dari pemerintah

Apa yang harus dilakukan?

- Berinvestasi pada proyek ini dan menjadi pemilik waralaba (*franchisor*)
- Menyediakan pelatihan dan penyuluhan terhadap petani lokal

the future of fuel

Proyek ini merupakan rangkaian kerja sama antara:

university of groningen