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**Saving and social functions of cattle in
smallholder livelihoods: A multiple case
study of cattle management in NTB,
Indonesia**

A thesis presented in
partial fulfillment of the requirements
for the degree of

**Doctor of Philosophy
in Agricultural Systems and Environment**

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TE KUNENGA KI PŪREHUROA
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Baiq Yulfia Elsadewi Yanuartati

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Abstract

In Indonesia and internationally, market-led rural development initiatives seek to transition smallholder farmers from current farming practices to those driven by market requirements. Expected outcomes from these often single product focussed initiatives are often not reached. This is the case in Eastern Indonesia where smallholder cattle farming and beef production is the target of market-led rural development initiatives that have not to date matched expected outcomes. This thesis answers the research question: What shapes smallholder farmers' management of cattle in NTB Indonesia and why? In so doing the complex dynamics that influence the management of one enterprise that is a part of a multiple interlinked livelihood is illustrated, and the reasons why single enterprise market led initiatives may need to be revised is made clear.

The sustainable livelihood framework and concepts of functions and attributes of livelihood assets and activities guided this research. A case study of two social groupings was conducted in the Nusa Tenggara Barat (NTB) Province, East Indonesia. Primary data was collected through in-depth semi-structured interviews supported by documents. Data was analysed and interpreted using qualitative data analysis.

Management of cattle by smallholders constituted decisions around ownership, care, buying, selling, and retaining of cattle, along with nutrition, healthcare, and mating. Smallholder management was dominated by cattle being primarily viewed as a form of saving rather than a source of household food or income. Cattle fulfilled a complementary function to other smallholder enterprises and household needs and were also significantly shaped by the significance of cattle to social and cultural norms that differ in nuanced ways across social groups living in the same location. The drivers for cattle management were not primarily market-led and the market dynamics around cattle reflected and reinforced the role of cattle in smallholders' livelihoods.

How smallholders manage an asset or an activity is evidenced in this research to be shaped by not only the function fulfilled by that asset, but also by that asset's relationship to other assets and their functions in the livelihood. This research argues that market-led initiatives that focus on a single enterprise will continue to fall short until greater consideration as to the place of that enterprise in smallholders' livelihood is considered in designing and implementing initiatives.

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List of Acronyms

Bappeda	Badan Perencanaan Pembangunan Daerah (Regional Development Planning Agency)
Bappenas	Badan perencanaan pembangunan nasional (National Development Planning Agency)
BPJS	Badan Penyelenggara Jaminan Sosial (Social Security Administrator for Health, BPJS) Kesehatan/Health
BPS	Badan Pusat Statistik (Statistics or Statistic Agency)
BSSP	Beef Self-Sufficient Programme
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
HDI	Human Development Index
JAKKAD	Jaminan Kesehatan Masyarakat Dompus
KUR	Kredit Usaha Rakyat
MHH	Men-header households
MLRD	Market-led rural development
NTB	Nusa Tenggara Barat
RPJM	Rencana Pembangunan Jangka Menengah
SLA	The Sustainable Livelihoods Approach
SLF	The Sustainable Livelihood Framework
The UN	the United Nations
WHH	Women-headed households

Chapter 1. Introduction

1.1. Background

Indonesia is a developing country in South-East Asia and almost half of its population lives in rural area. According to statistical data in 2019, there were 64% of the poor live in rural areas and most of them rely on the agricultural sector (Statistics Indonesia, 2020). Similar to most other developing countries, the majority of farmers in Indonesia are smallholder farmers, and most of them have farmland less than one hectare (The National Development Planning Ministry / The National Development Planning Agency, 2014).

Market-led rural development is a key policy agenda in Indonesia for rural smallholders to reduce poverty. Market-led rural development initiatives in Indonesia have been used by international development agencies such as FAO, UNDP, AusAID, and so on. Market-led rural development initiatives aim to enhance rural smallholders' ability to participate in markets (DFID UK, 2005) and have been a key policy agenda to broaden income opportunities and improve livelihoods for rural poor communities in developing countries (FAO, 2017).

Market-led rural development initiatives have been mainstreamed in Indonesia to help smallholders improve their competitiveness in markets (The National Development Planning Ministry/The National Development Planning Agency, 2014). The value of implementing market-led rural development initiatives is supported by Food and Agriculture Organization (FAO) of the United Nations (FAO, 2013). David Hallam, Director of the FAO's Trade and Market Division stated:

“Smallholder farmers need to be better integrated into markets in order to reduce hunger and poverty.” (FAO, 2013, para.2)

Hallam also emphasises the importance of providing training and assistance to smallholder farmers to help them increase their knowledge and skills to enable them to

participate in markets. Furthermore, he suggests that the smallholders should be supported by enhancing their capabilities to access sources of capital such as financial, physical and other forms of capital to support farm production. It is argued, development initiatives can bring changes for farmers to be more market-led and commercial in their farming systems (FAO, 2013). It is expected that market-led rural development initiatives will improve farmers' well-being through changing their motivation and practices in farm production (FAO, 2013). In addition, market-led rural development approaches are incentivising trade and investment that can help improve economic growth and alleviate poverty (DFID UK, 2005).

In the international level, market-led rural development initiatives in developing countries have been facing various challenges which make the poverty reduction agenda complicated. Arias, Hallam, Krivonos, and Morrison (2013) argue that the issues in supporting and facilitating smallholders to increase participation in markets are complex and vary. Some of the issues faced are related to production, and some others are related to markets and institutional aspects (Arias et. al., 2013). Lack of assets such as financial, human, and natural assets as well as infrastructures are often the problems faced by smallholders in production (Arias et. al., 2013). Some literature also reports issues around gender which prevent development achievements (Njuki & Sanginga, 2013; Meinzen-Dick et. al., 2014; Markel, Gettliffe, Jones, Miller, & Kim, 2016). In addition, market-led development policy designs and implementations do not achieve the goals because they overlook livelihoods of targeted people and existence of social contexts (Arias et. al., 2013; Neilson & Shonk, 2014).

Many market-led rural initiatives have been implemented in Indonesia to assist rural smallholders. One initiatives fostered smallholder enterprises in developing their businesses (The National Development Planning Ministry/The National Development Planning Agency, 2014). The government provided facilitators to assist smallholder enterprises, as well as provided resources (e.g. easy access to access credits or to provide grants) to enhance smallholders' capability to increase production, access to markets, and well-being (The National Development Planning Ministry/The National Development Planning Agency, 2014).

Indonesian agriculture is a target for market-led rural development because it is the sector that most poor people rely on (Statistics Indonesia, 2014; the National Development Planning Ministry/The National Development Planning Agency, 2014). The Government expects that targeting the agricultural sector for development initiatives will support Indonesia to improve rural livelihoods (The National Development Planning Ministry/The National Development Planning Agency, 2014).

The market-led rural development initiatives in the agricultural sector in Indonesia have two main aims. First, the initiatives aim to improve production and productivity of the main farm commodities (i.e. rice, corn, soybean, sugarcane, chilli, shallot and cattle). It is expected that improving production and productivity will reduce importation of those targeted commodities by enhancing national supplies (Planning Bureau-Ministry of Agriculture the Republic of Indonesia, 2014). The interventions are expected to help the Indonesian government to achieve the target of self-sufficiency, especially in the featured agricultural commodities including rice and cattle (Planning Bureau-Ministry of Agriculture the Republic of Indonesia, 2014). In order to increase supply, the government has increased the size of farming areas, provided access to low interest credit, and provided better infrastructure (Planning Bureau-Ministry of Agriculture the Republic of Indonesia, 2014).

Second, market-led rural development initiatives are expected to enhance smallholder farmers' competitiveness in markets (the National Development Planning Ministry/The National Development Planning Agency, 2014). In order to enhance farmers' competitiveness, development initiatives have implemented innovation in production and productivity by funding research and technology. Other strategies of the Indonesian Government to improve farmers' competitiveness have been to add-value to agricultural commodities and strengthen market chains (Planning Bureau-Ministry of Agriculture the Republic of Indonesia, 2014; the National Development Planning Ministry/The National Development Planning Agency, 2014). Market-led rural development initiatives have also been funded by several international development agencies (such as by ACIAR, FAO, ADB, AVRDC and others) focussing on research and development in supporting production and marketing of agricultural commodities in Indonesia (IAARD, 2019). Especially in the Eastern Indonesia, for example, in Nusa

Tenggara Barat (NTB) province, the Government cooperated with the international agencies such as ACIAR and JICA to develop cattle production and marketing (JICA-BSS, 2013). It was reported that the Japanese Government through JICA and the Indonesian Government have cooperated to support the 'a Million Cattle Land' or *Bumi Sejuta Sapi* (BSS) flagship programme in NTB province through improving beef cattle farming management, building infrastructure, and so on (JICA-BSS, 2013). Australian and New Zealand Governments introduced innovations and provided advisory services in improving the quality of live cattle and beef (Lombok Post, 2020). Market-led cattle development initiative in NTB is an important agenda because the province is one of the main five cattle producers in Indonesia (Statistics Indonesia, 2019). In national and international levels, cattle have been the focus of Indonesian Government and international development agencies of market-led initiatives; however, to date these programmes have not attained the outcomes sought.

1.2. Research problems, research question and objectives

Market-led development to improve cattle production in NTB, Indonesia has been the focus of development initiatives. The government provided smallholders with various support including training, technical advice, consultancy (NTB provincial government, 2014), and financial assistance through low-interest loans (NTB Provincial Government, 2014). International development agencies, such as the Japan International Cooperation Agency (JICA) and AusAID (Bappeda NTB, 2013b) have assisted implement the BSS initiative in NTB (Antara NTB, 2010). Antara NTB (2010) reported that these international agencies collaborated with the government (national and local) in conducting research and implementing programmes for cattle production improvement and market development as part of the BSS initiative. However, the initiative has not reached their goals, and most smallholders have not shifted their practices to be market-led (Waldron, Mayberry, Dahlanuddin, Quigley, & Poppi, 2013). Smallholders in the main continue to view and manage (production and marketing) their cattle traditionally (Waldron et al., 2013).

It has long been recognised that an enterprise like cattle is but one component of an integrated livelihood of smallholder farmers (Dorward et al., 2009; DFID UK, 1999).

Hence, smallholders' decisions on an activity, including responses to development interventions will be shaped by the relationships between components of the integrated livelihood. However, little literature has been published on what shapes smallholders' decisions around management of individual enterprises, including cattle, and responses to development initiatives.

This study focuses on cattle management by smallholders in the NTB province, Eastern Indonesia because this province is a target for cattle development in Indonesia. The research aims to inform development initiatives that seek to reduce poverty and enhance wellbeing amongst rural smallholders by making explicit the complex interrelationships that shape the management of single livelihood enterprise such as cattle. The complexity of the relationships between various aspects in rural livelihoods will be unpacked by using the Sustainable Livelihood Framework (the detail is in the Chapter Two). This study is expected to contribute to understanding smallholders' decisions as they relate to livelihood assets and why they respond to development initiatives as they do. This study is expected to help future development policies to be implemented effectively.

The research question that guides this study is:

“What shapes smallholder farmers' management of cattle in NTB Indonesia and why?”

This research aims to: 1) better understand livelihood dynamics in influencing management of cattle and smallholder farmers' response to development interventions the way they are; 2) provide theoretical contribution and inform future market-led rural research and development especially in Indonesia around smallholder farmers' management of cattle from the perspective of sustainable livelihoods.

1.3. Positioning and personal reflection of the study

In qualitative research, the researcher is one of the instruments of the research. Thus, in a qualitative study, the subjective element of the researcher is not ignored. To add to the understanding of readers to this research, I would like to give brief information about my background. It is related to where I grew up, my career and education. In addition,

this section provides an explanation of the beginning of my ideas on the issues that I planned to study. Also, it is associated with some of the changes and learning that I faced during this journey.

I am originally from Lombok Island, West Nusa Tenggara province with the background of Sasak, the largest tribe on the island. I grew up and started a family on Lombok Island and completed my undergraduate studies in this area (in Mataram, the capital city of NTB Province). My fields are elaborated for agriculture and rural extension research and development activities.

I am a qualitative researcher who conducted various social studies before undertaking this PhD. I have carried out qualitative research and development activities in the field of rural and agriculture since I completed my Master degree study.

I was involved in several research and development activities from international agencies, especially those from Australia focusing on Eastern Indonesia. In the latest research that I did before I started my PhD in 2015, I used the Sustainable Livelihoods framework by DFID UK. From this experience, I was convinced that this framework can help understand the complexity of rural systems, especially why rural people responded to an initiative in the way they do. However, the Sustainable Livelihood framework was a new concept for me at that time. This framework seemed complicated because the components varied, including context, types of assets, institutions, livelihood strategies and the outcomes. The situation made me feel that I needed more research experience in using the sustainable livelihood framework to gain deeper understanding around how the framework help understanding in both research and development.

Based on the research and development activities in which I was involved, I found that there was a trend to market-led rural development (MLRD) initiatives. Beef cattle are one of the main commodities targeted by MLRD initiatives in Indonesia, especially in the Eastern Indonesia (NTB, NTT, Bali, and Sulawesi). This is partly due to Eastern Indonesia being a target in the mission of increasing cattle population because the land is still extensive for cattle farming. Most cattle are produced by smallholder farmers, but the value placed on cattle is not as the primary source of income but as a means for

savings or protection. This aspect is an object that has not been thoroughly explored and dealt with until now related to cattle development. In fact, the government has set up a vision of beef self-sufficient in the National Long-term Development Plan (The RPJM Nasional) since the beginning of 2005. However, Indonesian' cattle production has to date been far away from being cattle and beef self-sufficient. Productivity of cattle has declined over a number of years until 2011 (Indonesia.go.id., 2018). For me personally this raised suspicion that there is an unanswered gap about why MLRD approaches such as the value chain approach are not able to answer more complex problems?

My experience using the concept of Sustainable Livelihoods (SL) has fed my curiosity to use this framework in addition to the Value Chain framework in answering the gap I described related to cattle development. This aims to understand how the position and roles of a commodity targeted by MLRD initiatives in the livelihoods of rural households. Moreover, it also helps understand how the complexities of livelihoods and the dynamics of strategies that are undertaken to make them respond to existing MLRD initiatives the way they do.

After reading the theories of MLRD, and SL, and empirical literature around rural livelihoods, I learned that there were several studies in accordance with my concerns had been done before. However, those are in different contexts and cases from my research.

In the processes of this PhD journey, I found that understanding complexity does not require simple calculations and causation between phenomena. I come to learn that farmers' decisions on the management of an agricultural commodity are not merely shaped by those related to the production of the commodity. Decisions involve broader systems and relationships that are more complex than just production and marketing. Based on the key findings in this study, I found that the Sustainable Livelihood framework helps interpret and understand the various phenomena, for example theories related to social norms, gender norms, functions and attributes of livelihood assets, rural development, institutions, and farm production and marketing in shaping smallholders' decisions on a particular livelihood activity. This is the uniqueness of my

PhD research and is a contribution to the existing body of knowledge and to rural development planning and practices.

1.4. Thesis structure

This thesis contains nine chapters written in a monograph style. The sub-section provides a brief summary of each chapter as follows:

Chapter one has introduced the research. The chapter provided an overview of the research information that includes introduction and background of the research, research problem, research question, positioning and personal reflection of the study, and thesis structure.

Chapter two is context of the research at the national level of Indonesia. This chapter covers the information of physical and socioeconomic characteristics including economic-agriculture of Indonesia. This also contains a brief overview of Indonesian government and market-led rural development in Indonesia. The information around cattle as one of the key agricultural commodities in Indonesia is presented and is followed by a summary of the chapter. This chapter provides information on the context of Indonesia that relies on agriculture for development. The research context also provides a basic understanding to help in interpreting the data.

Chapter three is the theoretical framework and literature review. This chapter is divided into five parts: introduction, importance of understanding rural livelihoods, theoretical framework, and empirical literature review, and summary. The chapter covers the importance of understanding rural livelihoods in implementations of market-led rural development and the rationale of employing the Sustainable Livelihood framework for the study. The theoretical framework contains the review of conceptual approaches drawn from in this study, which are around the concept of sustainable livelihoods and development of the concept. A critical review of relevant empirical literature that informs the research question of this study is presented. At the end of the chapter, a brief summary of the chapter is provided.

Chapter four is the research design that includes descriptions of the research paradigm used, the case study research design, site selection, data collection methods, ethical considerations, and data analysis. Overall, this research is qualitative and based on a constructivist paradigm. The data collection methods are semi-structured interviews and relevant documents. Small holder participants are from the same location and from two different social groups (the Transmigratory and Local cases) that have different cattle farming systems..

Chapter five describes the region and the site where this research was conducted. The chapter covers the characteristics of provincial level to the villages where the two cases were studied. These include physical and socioeconomic characteristics of NTB province, Dompu regency, Simpasai village, and Kampasi Meci village. Description around specific features such as Mount Tambora as the main grazing land in Dompu District and the history of the Transmigration Programme are presented in this chapter too. Features of rural and agricultural development at the provincial to the village levels are outlined, also. In addition, this chapter describes the characteristics of each case (the Transmigratory and the Local cases).

Chapter six is findings from the two cases the Local and Transmigratory. The findings chapter is divided into introduction, the Transmigratory case, and the Local case. The findings in each case include the roles of smallholder farmer livelihoods in shaping smallholder farmers' decisions on their cattle, and the roles of smallholder farmer livelihoods in influencing their decisions in relation to cattle management practices. The findings of each case are summarised at the end of each section, and the summary of the chapter is also provided in the last section.

Chapter seven is the cross case analysis. The findings from the two cases are compared and contrasted. This describes the similarities and differences, unpacks the reasons behind the similarities and differences, and the implications of them. This chapter contains 1) farmers' decisions around selling or retaining cattle; 2) buying and owning cattle; 3) farmers' decisions around cattle feed and strategies in farming cattle; and 4) responses to rural development interventions.

Chapter eight includes interpretation of findings (chapter six) and cross case analysis (chapter seven) based on relevant literature (chapter 3), with the support of the information provided in the research context (chapter two) and case description (chapter five). The discussion chapter includes theoretical characteristics following the introduction, mixed functions, attributes, and institutional aspects in shaping management of cattle, and a summary of the chapter.

Chapter **nine** concludes the thesis and the research question. This provides a summary and conclusion of the whole thesis content, which includes the key findings, theoretical contributions, and practical implications. It is then closed with the limitations of the study and suggestions for the future research.

Chapter 2. Research Context

2.1. Introduction

This research was conducted in Indonesia and Chapter 2 provides a description of the country. The aspects that are described include: Physical and socioeconomic characteristics (2.2 and 2.3); A brief overview of economic-agriculture (2.4); A brief overview of the Government division (2.5); Market-led rural development initiatives (2.6); Cattle as one of the key agricultural commodities (2.7); and (2.8) provides a summary of the chapter.

2.2. Physical characteristics of Indonesia

Indonesia is the largest archipelago in the world, and belongs to the Association of South East Asian Nations (ASEAN). It comprises 17,504 islands with a total area of 1,913,578.68 km² including land, sea, and an exclusive economic zone (Statistics Indonesia, 2016). This country lies between two continents (Asian and Australian), two oceans (Pacific and Indian), and is bordered by several countries such as Malaysia, Singapore, Philippines, Vietnam, Thailand, Australia, Timor Leste, and PNG (see the map in Figure 2.1 below).



Figure 2. 1. The map of Indonesia (insert: Nusa Tenggara Barat Province). Source: One World Nations Online¹, 2019

Indonesia has 34 provinces with five large islands and four groups of archipelagos. The islands are Sumatra, Kalimantan (Borneo), Sulawesi, Jawa (Java), and Papua. The groups of archipelagos (*kepulauan*) include Riau, Bangka Belitung, Nusa Tenggara (Sunda Kecil or Little Sunda), and Maluku (Statistics Indonesia, 2016).

Indonesia is a tropical country because it is located on the equator. It has two main seasons that are dry and wet seasons. The dry season is usually from April to October, while the wet season is from November to March. However, the length of each season often changes. As Indonesia is tropical, it is dominated by rainforest. In the upland, the weather is relatively cold and, in the area near Australia and Papua, it is relatively dry and Savannah. The average temperature is relatively stable, between 26°C and 28°C, with the humidity range between 70% and 90% (Statistics Indonesia, 2016).

¹ One World Nations Online (https://www.nationsonline.org/oneworld/map/indonesia_map2.htm)

2.3. Socioeconomic characteristics of Indonesia

Indonesia was colonised by several nations such as the Portuguese, Japanese, and Dutch for over 350 years. The country gained its independence on 17 August 2019 and is still a developing country, making an effort to reduce poverty.

The population of Indonesia has reached 255.5 million, the fourth highest population in the world with a 1.31% growth rate (Statistics Indonesia, 2016; World Bank, 2018). Java is the most populous island, where more than half of the total population of the country lives.

This country is diverse in terms of religion and ethnicity. The majority of the population is Muslim. There are also other religions such as Christian, Catholic, Buddhist, and Hindu. There are hundreds of ethnicities in Indonesia, and the Javanese are the largest population. They migrate from Java Island to other areas throughout Indonesia so that many Javanese can be found all over Indonesia. There are also several other largest ethnicities such as Sundanese, Maduranese, and Batak (Baker & Jones, 1998).

The official language in Indonesia is Bahasa Indonesia or Indonesian language. However, there are many traditional languages and dialects (around seven hundred) that are usually used as a first language. Dutch is not a familiar language; although this country colonised Indonesia for hundreds of years, it is not accepted as an official language in Indonesia (Baker & Jones, 1998).

From the total population of Indonesia, in 2015, 11.2% of the people live in poverty, and 20.78% of the total population are vulnerable to falling into poverty (World Bank, 2018). The life expectancy rate of Indonesian people in 2015 was 70.8 (Statistics Indonesia, 2016), or below the average life expectancy in the world population (World Health Organization, 2016). The literacy rate in 2015 was 95.2% (Statistics Indonesia, 2016) or above the average of the world literacy rate of age 15 in 2016 (The World bank, 2020)², and Human Development Index (HDI) is 69.6% (Statistics Indonesia,

² <https://data.worldbank.org/indicator/se.adt.litr.zs>, Accessed: 28 August 2020

2016). It is categorised as a Medium Human Development country based on the HDI development trend in 1990-2017 (UNDP, 2018)³.

2.4. A brief overview of economic-agriculture in Indonesia

Agriculture is one of the most important sectors in Indonesia (Statistics, 2016). In 2014, the total arable land was around 24 million ha, or 12.97% from the total land area of Indonesia, 30% of which was irrigated land (Quincieu, 2015). The area of farmland was 60,200,000 ha, and 90,325,600 ha of forest (FAO website, 2019)⁴.

The most common farmland purposes were for paddy area (13,797,300 ha) followed by corn (3,837,000 ha) (Statistics Indonesia, 2016). In 2014, around 8,114,829 ha was wetland (Statistics Indonesia, 2016). In 2014, the national production of rice was 70,846,500 tons, and corn was 19,008,400 tons (Statistics Indonesia, 2016). The other purposes of farmland in Indonesia were to grow soybeans, peanuts, and cassava, and some other commodities (Statistics Indonesia, 2016).

Poverty in Indonesia decreased gradually from 2009 (14.15%) to 2016 (10.70%) (Statistics Indonesia, 2017b). The number of poor people has always been dominated by those who lived in rural areas and worked in the agricultural sector (Statistics Indonesia, 2016). The number of people who worked in the agricultural sector was 37.75 million or 32.88% of the total workforce in Indonesia in 2015 (Statistics Indonesia, 2016). There were 5.09 million people (4.43% of the total workforce in Indonesia) who worked as non-permanent labourers in the agricultural sector (Statistics Indonesia, 2017b).

In 2016, the Gross Domestic Product (GDP) per capita was IDR 45.2 million (Statistics, 2016). The rate of increasing GDP of Indonesia decreased gradually from 2011 (6.17%) to 2015 (4.88%), then slightly increased in 2016 (5.02%) (Statistics Indonesia, 2016). The agricultural sector was the second contributor to the GDP in 2016, being 13.45% of

³ <http://hdr.undp.org/en/composite/trends>. Accessed: 28 August 2020

⁴ <http://www.fao.org/countryprofiles/index/en/?iso3=IDN>. Accessed: 28 August 2020

the total GDP (Statistics Indonesia, 2016). The first contributor was the industrial sector (20.51%) (Statistics Indonesia, 2017b).

The contribution of the agricultural sector slightly decreased in 2017, to 13.14% from 13.45 in 2016. The main source was from the estate crops (3.47% of the GDP) followed, in order, by food crops, fisheries, livestock, horticultural crops, forestry, and agricultural service and hunting (Statistics Indonesia, 2017a).

Overall, the production of the components in the agricultural sector increased, except in horticulture and fisheries during 2016-2017 (Statistics Indonesia, 2017a). There were two types of food crops, wet and dry farmland. Rice is the wetland commodity which experienced an increase in production to 7.02% in one year. Rice dominates the food crop production in Indonesia because it is the staple food for most of the people (Fuglie, 2010). However, among the dryland crops, only corn production increased while others decreased significantly. Horticultural production was significantly decreased by 14.12%, and the estate crop production increased by 5.17% (Statistics Indonesia, 2017a). Livestock production slightly increased 2.08% from 2016 to 2017, while forest production was relatively stagnant (Statistics Indonesia, 2017a). The data was not available for fishery between 2016 and 2017 (Statistics Indonesia, 2017a).

2.5. A brief overview of government division in Indonesia

The Republic of Indonesia is led by a president and is chosen through direct election by the citizens. In the past, a president was the central leader that had absolute power to control the Government all over Indonesia. However, since the decentralisation policy was enacted in 1999 (Act Number 22 of 1999 and was revised by Act Number 32 of 2004), the local governments have more power to administer most of their local resources.

There are four levels of local government in Indonesia. The first level is provincial that is led by a governor (*gubernur*) who is elected by citizens once every five years. There are 34 provinces in Indonesia (Statistics Indonesia, 2016), and each province has legislative members who work with the provincial government.

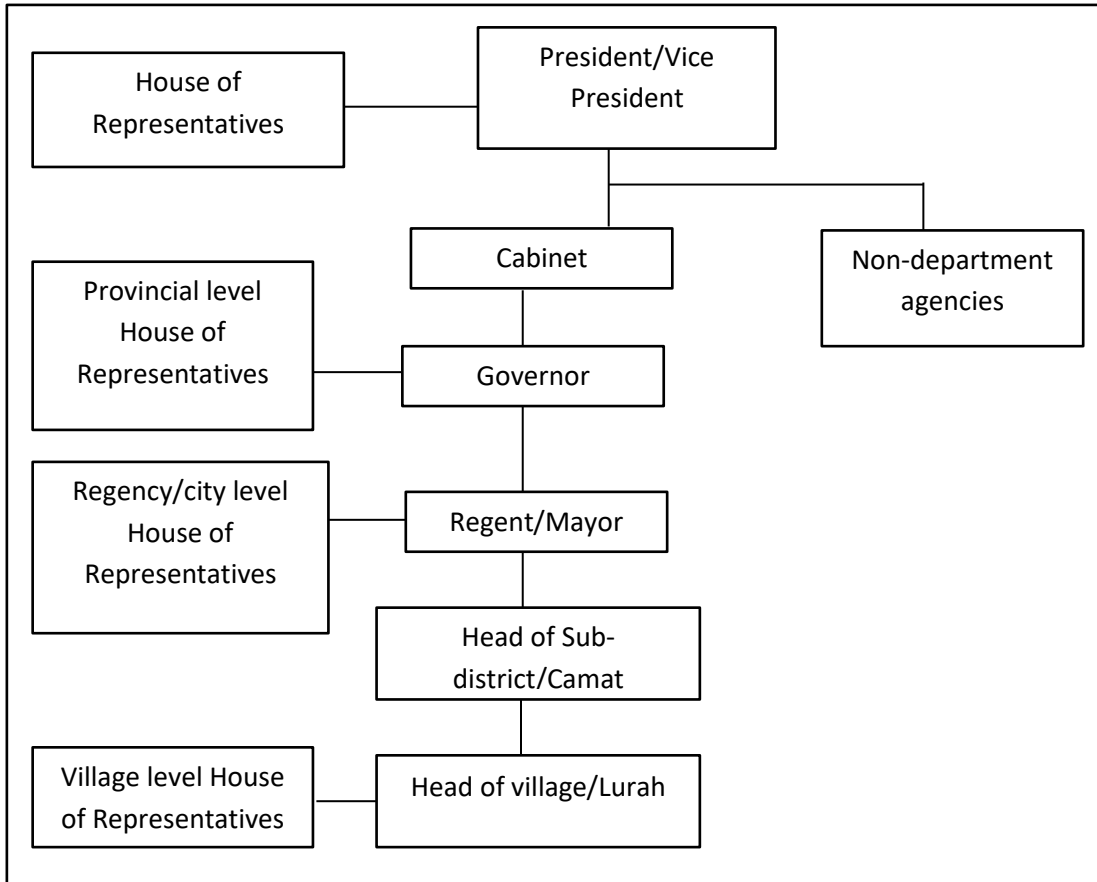


Figure 2. 2 Divisions of the Indonesian Government. Based on UU no. 23 tahun 2014.

The second level under a province is regency (*kabupaten*) or city (*kota*). There are 416 *kabupaten* and 98 *kota* in Indonesia (Statistics Indonesia, 2016). A *kabupaten* is headed by *Bupati* (regent) while a *kota* is headed by *wali kota*(mayor). The head is elected by their people. *Kabupaten* and *kota* are at the same level, but different in some aspects such as the area covered (*a kabupaten* usually covers a wider area than a *kota*). The second level government also has legislative council.

The third level is sub-district (*kecamatan*) or districts (*distrik*). Most of the areas in Indonesia use the term *kecamatan* for the third level of local government but, in some areas, such as in Papua, it is called *distrik*. There are 7,024 *kecamatan* or *distrik* in Indonesia (Statistics Indonesia, 2016). A *kecamatan* is headed by *camat*, while a *distrik* is headed by a *kepala distrik* (a district chief). The head is not elected by the people but by the upper level government. The third level is exactly beneath regency or city, but it does not have a representative council.

The fourth level is village (*desa*) or urban community (*kelurahan*). The terms for this level are also different in different areas in Indonesia such as *gampong*, *nagari*, and so on. A *desa* is led by a *kepala desa* (a head of village), and a *kelurahan* is led by a *Lurah*. There are 81,626 villages in 2019 (Statistics Indonesia, 2016). A village also has representative councils.

2.6. Market-led rural development

The spirit of market-led rural development (MLRD) is cited from a study regarding rural development in developing countries as follows: “Market expansion, linking smallholders to high-value markets, is the avowed aim of many current agricultural programmes by governments and NGOs” (Kristjanson et al., 2014 p. 109).

It is argued that rural development interventions can achieve the goals to improve rural livelihoods through various strategies and programmes (Rivera & Qamar, 2003). There is no single or generic recipe that works effectively for all places or communities in the developing countries because the issues are diverse and complex. However, there are some aspects in the rural development policies which need to be considered. Access to markets for smallholder farmers is one of the crucial aspects. The efforts to increase smallholder farm production will not be useful to enhance income if the markets and strategies to support market participation are not sufficient.

2.6.1. History of market-led rural development in Indonesia

Indonesia has experienced several periods of development in agricultural sectors. A rapid agricultural development in this country happened between 1968 and 1992 during the New Order period in President Soeharto’s era (Fuglie, 2010; OECD, 2012).

This period was known by “green revolution” in agriculture. During the green revolution, the Government pushed intensification of food crops, especially the staples such as rice, corn and cassava. During Soeharto’s era, Indonesia reached self-sufficiency in rice production (Fuglie, 2010). From the mid-1960s to the mid-1980s the National Logistic Agency (*Badan Urusan Logistik or Bulog*) dominated the supply chain of food crop commodities such as rice or corn. Bulog took the roles to buy farmers’ yield and to support farmers in their farming and marketing (OECD, 2012).

Compared to the previous era, during President Soekarno’s era, Indonesian economic development faced crisis, especially in the rural areas where most people lived. Poverty was severe. In the green revolution, the use of chemicals materials was pushed for farmers in order to increase production (Fuglie, 2010).

There were several basic aspects of intensification in food crop farming that were pushed to increase production and productivity. Those were increasing technology of cultivation (e.g. soil tillage, spacing, and so on), improving irrigation system, applying chemical materials such as fertilizers, pest, and using hybrid seeds. The Government also supported farmers with extended farming area, especially outside of Java Island, and financial support through banks.

After 1992, the growth of food from farm production was stagnant (Fuglie, 2010). The situation was also worse as Indonesia faced economic crisis in 1997-1998, and President Soeharto lost his power and authority (Fuglie, 2010). The monopoly of Bulog was gradually demolished (OECD, 2010). From 2002, rural development in Indonesia has become more “liberal” or more market-oriented (Fuglie, 2010; OECD, 2012). The mechanism of agricultural production depended on markets. Moreover, the focus was not only on food crops anymore, but the commodities had expanded into several commodities such as plantation crops, livestock and fisheries.

Since the 2000s, the agricultural development in Indonesia is still market-oriented (Fuglie, 2010). The Government has revitalised some institutions that support smallholder farmers such as input into grants programmes for crop farming, increasing water system management, and protecting local production from loss arising from importation of particular commodities (OECD, 2012).

In Indonesia, projects from international agencies (e.g. UN agencies, USAid, or AusAID) were mainly aimed at helping Indonesia to deal with monetary issues after the economic crisis in 1998 (Neilson, 2014). They empowered the most vulnerable groups in a community to be able to increase their participation in markets and to increase their well-being (Neilson, 2014). This study highlights the role of institutions is crucial in helping the success of MLRD initiatives. For example, decisions in development in Indonesia are heavily affected by political influences, thus making it very difficult to manage this aspect and focus only on the results of technocratic analysis.

2.6.2. *Agricultural development in Indonesia*

The Government developed a series of strategic plans of agricultural development in several periods. This policy was implemented by the Ministry of Agriculture.

The Ministry of Agriculture compiled the first period 2005-2009 in the Strategic Plan I. The Ministry's focus was on increasing food security, agribusiness, and welfare. First, in the context of increasing food security, the Government prepared programmes to protect households in Indonesia. It was expected that the people could have easy access to cheap food and good health. The second strategy was to increase community agribusiness activities so as to increase agricultural production, increase the added value of production, and encourage integrated farming (food crops-livestock-fishery). The third strategy was to improve the welfare of farmers more broadly. Welfare did not only increase farmers' income, but also strengthened farmer institutions (farmer groups), strengthened agribusiness, protected product prices at the farm level, and increased farmers' access to productive resources. Agricultural priority commodities in this period included rice, corn and cattle. The Government aspired to reach commodity self-sufficiency for this at the end of this period.

In the second period II (2010-2014), the Government made seven types of revitalization. Those were: (1) land revitalization, (2) seed and nursery revitalization, (3) infrastructure and facilities' revitalization, (4) human resource revitalization, (5) farmer financing revitalization, (6) revitalization of farmer institutions, and (7) revitalization of technology and downstream industry. In addition, in its implementation, this revitalization was based on agricultural commodities. According to

the policy document, there were 39 types of agricultural, livestock and fishery commodities which were prioritized according to the local resources owned by each region. The purpose of the policy in the second period was to continue the self-sufficiency efforts targeted at RPJMI (2009-2014) by adding more commodities.

For the Strategic Plan in the third period (2015-2019), the Government put an emphasis on increasing farm agribusiness to become more competitive by using available resources. Moreover, those were supported by qualified human resources and mastering science and technology. The Government wanted to continue the seven types of revitalization programme from the second period to the third period. Strategies designed in the third period aimed to (1) Achieve self-sufficiency in rice, corn and soybeans, as well as increase sugar and meat production, (2) increase food diversification, (3) increase value-added and competitiveness of commodities, export, and import markets, (4) provide raw materials for bio-industry and bioenergy, (5) increase the income of farm families, and (6) increase accountability of good government apparatus performance (Setiyanto & Irawan, 2016).

Rural development is one of the largest national budget allocations in Indonesia. This allocation is not only given at the Ministry of Agriculture, but it is also distributed to other sectors to help increase agricultural business. For example, budget allocations in the Ministry of Public Works aim to support infrastructure development, Ministry of Manpower and Transmigration to increase labour absorption, and other relevant departments in rural development. The largest budget investment for agricultural and rural development is infrastructure development, followed by the cost of counselling, research and development, education and training (Setiyanto & Irawan, 2016).

For the performance results of the strategic plan in the first and second periods, it was found that the realization (absorption) of the agricultural development budget in all commodity sectors decreased from 2005-2014. However, in the field of horticulture and cattle development it was increased (Setiyanto & Irawan, 2016). For example, the budget for the main food crop businesses (rice, corn, soybeans) decreased annually by an average of 0.1% over this period. From the national budgeting, only cattle development programs compared to other livestock development programmes

achieved the target of national expenses (100% used). This achievement made the government increase the investment for cattle development as a new challenge in this sector.

On the other hand, budget absorption also decreased, along with the decline in production of some agricultural commodities in the period 2005-2014 (Setiyanto & Irawan, 2016). There are some that had increased production. For example, among the main food crops, only corn experienced an increase in production by 0.16% per year from 2005 to 2009 (Setiyanto & Irawan, 2016). However, corn production then declined sharply to 17.61% per year from 2009 to 2014 (Setiyanto & Irawan, 2016). As for rice production, the average decline since 2005-2014 was above 5%. For livestock, the average decline in production in the period 2005-2014 amounted to 11.73% annually. Cattle that absorbed the largest funds also experienced a decline in production up to 9.45% per year. This shows that the programme implementations were still not effective to achieve the production increase, and the expectations of efficiency in agricultural commodities were far from the target (Setiyanto & Irawan, 2016).

This decline in agricultural production performance was due to the complex aspects that occur in Indonesia. These aspects related to constraints to production, resources (natural, human, and social), institutions, and weak coordination between stakeholders. Moreover, the most important thing that was found as an obstacle in the target development programme was that it was still not specific to the region, so the programme became less realistic and difficult to achieve the target (Setiyanto & Irawan, 2016).

2.7. Cattle as one of the key agricultural commodities in Indonesia

This subsection presents the nature of cattle development initiatives that have been carried out in Indonesia. It also gives a brief description of the cattle market. Government of Indonesia has set a goal in national development to achieve beef cattle sufficiency to meet the national demand. However, the development initiative faced several challenges which meant that the country has not yet achieved the goal.

2.7.1. Cattle development in Indonesia

The agricultural sector remains a crucial sector in Indonesia's development to date. Some Indonesian agricultural products have increased every year. However, in terms of domestic needs, most agricultural commodities are in deficit so they must be met with imports (OECD, 2012; Statistics Indonesia, 2016). Beef cattle are one of the most important agricultural commodities in Indonesia but are still experiencing a deficit.

The national cattle population in 2014 was 14,726,700 (Statistics Indonesia, 2017a). The largest national supply was from East Java (30%), Central Java (13%), South Sulawesi (7%), NTB (5%), NTT (5%), Lampung (5%) and Bali (5%) (Rahayu, Srihadi, Mahardika, Subroto, Chalid, Cholid, & Rumantir, 2014). The percentage is a contribution to the national cattle population (Rahayu et al., 2014). If based on the calculation of the RPJP (2005-2025), the national beef demand to meet the consumption needs of beef in 2025 would be 2.4 million. However, with the condition that there would be no change in the pattern of consumption of raw beef (1.7 kg per capita per year), the number of live cattle nationally available would be only 1.8 million (Rahayu et al., 2014), so the supply would still experience a deficit.

The Government has imported beef to meet the current beef supply deficit (Rahayu et al., 2014). To reduce dependence on beef imports, the Government had a vision to reduce the imports by initiating a national beef production improvement programme between 2005 and 2014 (Gayatri & Vaarst, 2015). This vision was implemented with the initiation of a flagship programme called the Beef Self-Sufficient Programme (Program Swasembda Daging Sapi Nasional, BSSP) (Gayatri & Vaarst, 2015).

The BSSP is an umbrella programme that was implemented during the period 2005-2013 (Gayatri & Vaarst, 2015). The main goal was to reduce cattle imports up to 10% by 2014 (Gayatri & Vaarst, 2015). The programme consisted of various interventions aimed at, not only encouraging the production of cattle populations, but also the welfare of farmers through improving cattle business. The programme was an initiative that began in 2001-2005, but was not able to reach the target of self-sufficiency until the end of the targeted period (Gayatri & Vaarst, 2015).

The BSSP was supported by the Regulation of the Minister of Agriculture Number: 59 / Permentan / Hk.060 / 8/2007 concerning Guidelines for the Acceleration of Achieving Beef Self-Sufficiency. Based on this regulation, the central government coordinated with the local government to optimize the local resources available to increase cattle production. Moreover, the Government also provided facilities and infrastructure that needed to be added so that the vision of national self-sufficiency and beef could be achieved. The main targeted facilities included the provision of artificial insemination (AI), healthcare services for livestock, and optimizing farm management.

To encourage an increase in cattle population, the Government seemed to target more production in areas that still had a very large land area than in Java, which had a high population density. The focus of production was more on cattle farms that used grazing systems, especially outside Java, for example, in Eastern Indonesia (Agus & Widi, 2018; Priyanti, Hanifah, Mahendri, Cahyadi, & Cramb, 2012). This is because, in Java, crop farming was the main commodity, and food crop and livestock farming were more intensified in dealing with limited land in Java Island (Priyanti et al., 2012). Moreover, intensive food crop farming had the potential to conflict with the interests of land for cattle farming in Java, so the Government is looking for opportunities to develop local livestock outside of the Java Island (Agus & Widi, 2018; Priyanti et al., 2012).

There were a number of recommended breeding strategies to increase cattle production in Indonesia. First, increasing the use of artificial insemination (AI) from 50% to 70% (2005-2013); second, increase the success of breeding (AI) through research so that, in 2015, the success rate of breeding is expected to increase from 70% to 90%; third, preventing calf death from 40% to 20% in 2014, and fourth, to prevent early cutting of cows (Rahayu et al., 2014).

Since the first period of the Strategic Plan, the Ministry of Agriculture began to target beef self-sufficiency. In the second period, beef self-sufficiency efforts were also continued. In the second period, the Government had seven general strategies which were the reference for development programs in the agriculture sector, including the development of cattle in the 2010-2014 periods. In terms of cattle development to increase production, the Government also applied revitalisation of the seven aspects:

1. land revitalization includes increasing the availability of forage land for livestock;
2. revitalization of breeding cattle, mainly using AI techniques;
3. revitalization of infrastructure such as the development of livestock markets in the regions;
4. revitalization of human resources is carried out through capacity-building activities for farmers, improvement of counselling services, and assistance;
5. revitalization of farmers' financing aims to strengthen financial support for farmers, for example, by providing credit programs for farming;
6. development programme also targets the revitalization of farmer institutions, for example, the formation and function of farmer groups or farmer cooperatives as important mechanisms in the process of cattle development activities; and
7. revitalization of downstream technology and industry aims to increase the value of beef in each of its marketing chains.

To sum up, in the strategic plan, the government pays attention from upstream to downstream of cattle farming (from production to processing and marketing beef products) in order to achieve the vision of beef cattle sufficiency. Based on the strategic plan, the purpose of cattle development is to increase production and product quality in the market. The development programs can, then, ultimately increase the income or welfare of farmers in addition to meeting the needs of national meat consumption.

2.7.2. *Cattle production and marketing*

One of the main challenges to achieving self-sufficiency is that national production comes mostly from small-scale farmers; value is placed on cattle and there is a lack of motivation in commercialising cattle. Cattle production in Indonesia is dominated by smallholder farms, where farming is not the main business (Rahayu et al., 2014). The rest (30%) is a feedlot or farming business aimed at regular income (Gayatri & Vaarst, 2015; Priyanti et al., 2012). Cattle, according to most farmers, are expenses for emergency time, so cattle farming are not generally a primary source of income for

them in Indonesia (Rahayu et al., 2014). Only a few farms in Indonesia (1%) consider cattle as a business activity or commercial activity (Agus & Widi, 2018).

Cattle production systems in Indonesia, similar to the systems in other Asian countries, have some categories: landless, crop-based, and rangeland (Agus & Widi, 2018). Even farmers who do not have their own land have opportunities to raise cattle. Moreover, as it was explained in this chapter, some areas are dominated by more intensive farming system (crop-based farming) such as in Java, or rangeland or grazing land as in Eastern Indonesia. Hence, cattle development is needed which is suited to the types of production system. Some initiatives have been implemented, such as the integrated (crop-livestock) farming system, and plantation-livestock farming system to deal with the issues of land and forage. Other initiatives in cattle development in Indonesia include the implementation of technology to produce feed, increasing the quality of feed, and increasing the innovation on the feed crops for farmers (Agus & Widi 2018).

From the marketing aspect, there are several studies that were conducted to analyse the Indonesian cattle market system. From the value chain analysis conducted, there has not been a significant value development in marketing cattle at the local level in rural Indonesia (Rahayu et al., 2014; Waldron et al., 2013). The research found that the cattle marketing chain is a supply chain without value chain development (Waldron et al., 2013). Moreover, the linkages between actors in the supply chain are weak, therefore, coordination between actors in increasing the value chain is also weak (Waldron et al., 2013). This applies to most actors in each chain, especially at the local level (sub-districts and regencies) (Rahayu et al., 2014). At the producer level (farmers), cattle production was low input and low output (Waldron et al., 2013). Moreover, supervision and training were limited at the farm level due to the lack of extension activities for them, unless there were other initiatives (projects) that were given to some groups only (Waldron et al., 2013). In addition, it is customary for cattle farmers to sell only to local collectors or to local abattoirs (households or official government slaughterhouses). However, these slaughterhouses carry out slaughtering without knowing how to maintain the quality of the meat (Rahayu et al., 2014). There has not been an optimal effort from other parties to help provide tools and training to improve cattle slaughtering techniques (Rahayu et al., 2014). In addition, the processing of meat

products in the local scale is also constrained by the costs of production and marketing so that guidance is still very minimal (Rahayu et al., 2014). Most beef processing is done by restaurants or small-scale food sellers (e.g. Bakso) (Agus & Widi, 2018).

Until now, national cattle production is still far from sufficient because it can only meet 45% of national meat needs (Agus & Widi, 2018). This is certainly a concern for the Government in their effort to achieve the visions of the national self-sufficiency programme.

2.8. Summary of the chapter

Indonesia is a tropical country that has two main seasons - dry and rainy seasons. Climate is an important aspect for Indonesia because this country relies on the agricultural sector to feed the people who are the fourth most populous country in the world.

The market-led rural development approach has been going through a long history in Indonesia. Currently, the rural and agricultural development interventions are carried out by the Government, coordinated with other stakeholders including overseas agencies. The goals of rural and agricultural development by international, national, and local institutions are based on a market-led rural development approach. The overall goals of the development interventions are to increase farm production, farm profits and, hence, farmers' welfare. The focus is not just on increased production; the development interventions aim to achieve self-sufficiency for several main commodities in Indonesia such as rice, soy-bean and beef-cattle.

Development in the rural and agricultural sector is based on several stages of time periods. Those are long, medium, and short terms. The implementation of development programmes also involve various stakeholders at different levels (national, local, and international) and various different institutions so that the implementations run in harmony, are balanced, effective and efficient.

Beef is one of the important commodities in the agricultural sector that has been focused in the national development since the beginning of the long-term development

planning in 2005. The main feature that shapes beef-cattle farming is that cattle are an important asset for farmers, but they are not considered a primary income. Instead, cattle are viewed as a saving strategy to deal especially with emergency needs. In fact, the statistics show that Indonesia has not yet reached the goal of beef self-sufficiency. It is suspected that farmers' views on beef-cattle shape the farming system and, hence, influence the production. Those are low input low - low output cattle production. Moreover, cattle farming are not market-driven. However, there has been little study to look at what shapes smallholder farmers' decisions on management of their cattle that influences the way they respond to development interventions.

Chapter 3: Theoretical framework and literature review

3.1. Introduction

This chapter critically reviews the literature that answers the research question “What shapes smallholder farmers’ management of cattle in NTB Indonesia and why?” This study is conducted using the theoretical lens of the sustainable livelihoods framework. The chapter is divided into five main parts. Section 3.1 is the introduction to the chapter. Section 3.2 discusses the importance of understanding rural livelihoods in relation to the implementation of market-led rural development, also setting out the rationale for employing the sustainable livelihoods framework for the study. In section 3.3, the literature on the sustainable livelihoods framework, the theoretical framework for the study, is reviewed. Section 3.4 reviews the relevant empirical literature on the factors that influence farmers’ management of their cattle enterprise in a developing country context. In section 3.5, a summary of the chapter is presented.

3.2. The importance of understanding rural livelihoods in the implementation of market-led rural development and the rationale for employing the sustainable livelihoods framework for the study

Market-led rural development has been an important item on the agenda of developing countries (DFID UK, 2005), and was inspired by the neoliberal perspective which emerged in the 1970s (Borras Jr, Carranza, & Franco, 2007; Haymes, de Haymes, & Miller, 2014). This perspective was initiated by “neo-liberal institutions” such as the World Bank (Borras Jr, Carranza, & Franco, 2007; Borras Jr, Kay, & Lahiff, 2013) and the Food and Agriculture Organization (FAO) of the United Nations (FAO, 2013). From a neoliberal perspective, markets and the private sector play an important role in economic development creating more open competition among actors (Lynch, 2006). As a consequence of this competition, people can become more creative and more market-sensitive in managing their enterprises so that they can maintain their participation in markets, and sustain their livelihoods (Stoian, Donovan, Fisk, & Muldoon, 2012).

The fundamental assumption underlying market-led rural development, from a neoliberal perspective, is that actors are expected to become more empowered to participate in markets and more motivated to improve their economic well-being (Lynch, 2006; Simon, 2008). Therefore, the aim of market-led rural development initiatives is to help poor and marginalised actors to participate in markets and increase their income (Borras Jr et al., 2007; FAO, 2013). It is also expected that the farmers will be more empowered to undertake efforts to participate in markets independently, and that development programmes can play an important role in its facilitation (Ayele, Duncan, Larbi, & Khanh, 2012; Lynch, 2006).

The value chain framework has been widely used in studies of rural-led market development, particularly in developing countries. The framework has been widely employed in countries such as Asia, Africa, and Latin America to investigate rural (especially agricultural economic) development, and analyse the relationships between actors within markets (Devaux, Torero, Donovan, & Horton, 2018; Donovan & Poole, 2013). Several authors have stated that the value chain concept offers a framework for analysing the linkages between actors at all levels of the market chain, both vertical and horizontal (from producers to consumers or between actors on the same level) (Kaplinsky & Morris, 2001; Schure, Ingram, Sakho-Jimbira, Levang, & Wiersum, 2013). In regard to rural development, the value chain approach in rural development initiatives analyses the nature of relationships between actors in a value chain and to upgrade the value chains to become more commercial and empowering for smallholder actors. In short, the studies around market-led rural development have often focused on the relationships between smallholder actors and markets. However, studies such as conducted by Neilson and Shonk (2014) and Challies and Murray (2011) have found that market-led rural development initiatives have often failed to capture the complexity of the situation which is faced by smallholder farmers in their livelihoods.

Hence, several scholars have suggested that policies and research in rural development should consider the use of the sustainable livelihoods framework to examine the impacts of market-led rural development initiatives (Challies & Murray, 2011; Elizondo, 2017; Ellis & Mdoe, 2003; Neilson & Shonk, 2014; Scoones, 1998, 2009; DFID UK, 1999; Thennakoon, 2004). Currently, market-led rural development agencies have started to

adopt the scholars' recommendations, which consider the complex of livelihoods in the implementation of market-led rural development. Some development agencies, such as the Department for International Development (DFID) UK and the Swiss Agency for Development and Cooperation (SDC) Switzerland, have developed an approach called the Making Markets Work for the Poor (M4P) which mixes between the concept of value chains and sustainable livelihoods (the Springfield Centre, 2015).

Some scholars have also combined the market-led and livelihood frameworks in their studies to understand the relationships between smallholder actors and markets, especially when smallholder actors are parts of market chains. A study in Indonesia combined the value chain framework with the concept of sustainable development to determine the impact of the development of a cattle value chain on the sustainability of the natural resources in the area (Gayatri, Gasso-tortajada, & Vaarst, 2016). Other studies have also investigated the social and economic impacts of market-led initiatives on smallholder farmers' livelihoods. Several studies (Donovan & Poole, 2013; Kristjanson et al., 2014; Neilson & Shonk, 2014; Schure et al., 2013) have combined the value chain framework with the sustainable livelihoods framework to provide a more useful structure for investigating market-led rural development in developing countries. The sustainable livelihoods framework considers not only the smallholder farmer household's assets, but also the relevant institutions, the mix of livelihood activities they undertake, and the various strategies that shapes management of an enterprise (DFID UK, 1999; 2008).

While the mixed framework has been implemented in various studies, such research still lacks the detail of the nature of smallholder household livelihoods in shaping their decisions in managing a particular enterprise and in connecting to markets. A household livelihood comprises mixed strategies (assets, institutions, and activities); these are related to each other and are influenced by external factors (Mensah, 2011; DFID UK, 1999). The scholars argue that decisions made by a household in an enterprise management are not only shaped by the aspects that are only related to the enterprise but also by the broader household livelihoods. However, how the decisions shape each other in smallholder farmer livelihoods have not yet been explored in detail, even when the market-led framework was combined with the sustainable livelihoods framework.

Therefore, this study has revisited and reused the sustainable livelihoods framework in order to gather more in-depth information.

3.3. The sustainable livelihoods theoretical framework

The present study used the concept of sustainable livelihoods to explore smallholder farmer management of cattle in an area where a market-led development initiative had been implemented to improve cattle production and marketing. This concept helps to gain a comprehensive understanding, from a smallholder farmer's livelihood perspective, of how an enterprise is run and managed. It starts with the idea that, in smallholder farmer livelihoods, all aspects of their livelihoods are interlinked and shape their decisions on how an enterprise is managed. Firstly, this section explores the basic concept of sustainable livelihoods and how it has been used in studies. The sections begin with a review of the definitions of the concept of sustainable livelihoods then, how this concept has developed over time, is presented.

3.3.1. The sustainable livelihoods framework

The definitions of *livelihoods* and *sustainable livelihoods* were introduced by Chambers and Conway (1992):

"A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-term" (p. 7).

This definition has formed the basis for research into the sustainable livelihoods of rural people in developing countries over the past few decades. Other definitions have been provided since 1992, but they all draw on the definition first established by Chambers and Conway (1992). For example, Scoones (2009, p. 172) defined the term livelihood as "... a complex web of activities and interactions that emphasises the diversity of ways people make a living". Liu, Chen, and Xie's (2018, p.3) definition of livelihoods is similar to other definitions and "... refers to the way people make a living, which is based on

capacity, assets and activities”. Elizondo (2017) combines the definition of livelihoods from Chambers & Conway (1992) and Scoones (1998, 2009) that is “...the skills, assets (both material and social) and the approaches which will be used by individuals and communities in order to survive”. The following section describes the evolution of the sustainable livelihoods concept since its inception in 1992.

3.3.2. *The development of the sustainable livelihoods framework*

Since the introduction of the concept of sustainable livelihoods by Chambers and Conway in 1992, various scholars and rural development practitioners have developed models which describe the factors that influence a household’s sustainable livelihood. These models have been developed into a framework which has then been used for both research and rural development.

The sustainable livelihoods framework has been widely used by various parties in studies and development in the past twenty decades. The framework has also been used flexibly in different livelihood contexts in various countries. However, there has been no basic change in the basic components of the sustainable livelihoods framework, but the work in research and development has enriched each component of the framework. The framework that has been most widely used to date is that initiated by DFID UK in 1998-1999. The following paragraphs describe the important modifications that have been made to the sustainable livelihoods framework since 1992.

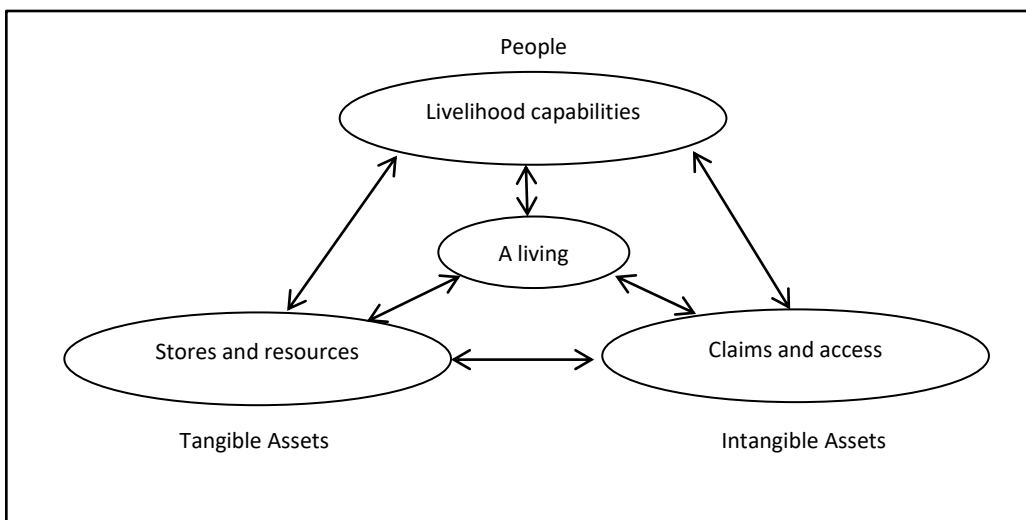


Figure 3. 1 Components and flows of a livelihood by Chambers and Conway (1992)

The sustainable livelihoods approach (Chambers and Conway, 1992) describes the components of a livelihood, the interactions between the elements of the framework, and the factors that influenced the interactions. The components include people and their capabilities in livelihoods, intangible assets (claims and access), tangible assets (stores and resources), and activities for means of living. This framework highlights the difference between tangible (stores and resources) and intangible assets (claims and access). *Stores* in this framework refer to tangible assets which can be stored such as food, shares, and savings. *Resources* include land, water, and tools for farming. The tangible assets which can be grouped as both *stores* and *resources* are livestock and trees. On the other hand, "*claims* are demands and appeals which can be made for material, moral or other practical support or access" (Chambers & Conway, 1992, p. 8). *Access* refers to the opportunity to use stores, resources, and services. Claims and access can be carried out by individuals, groups or institutions. The scholars argue that a livelihood can be sustainable if it can adapt to shocks and stresses, and continue on to future generations. In this concept, it is believed that everything in livelihoods is connected to everything else and the framework can be used to look at different levels from the household, national, and global levels. Development agencies can use it as a development approach to increase people's capability, social equity, and social sustainability. For research, the framework is a tool to understand dynamics in livelihoods in relation to particular conditions. For example, in measuring population, it can be used to gain a deeper understanding of why people tend to have fewer children.

The sustainable livelihoods approach was further developed by Scoones together with the Institute of Development Studies (1998). Scoones also refers to the concept of sustainable livelihoods of Chambers and Conway (1992). Scoones extends the aspects to be highlighted for analysis such as the importance of institutions and organizations in livelihood strategies, and social resilience and sustainability of livelihoods as the livelihood outcomes. The framework enables the description of how assets (various types of capital) and resources are used for livelihood strategies together with the influence of institutional aspects in particular contexts to achieve livelihood outcomes (Scoones, 1998). Overall, the main components of the Scoones' sustainable livelihood framework include contextual conditions and trends, livelihood resources that

comprise various types of capital (natural, human, financial, social, and others), institutional processes and organizational structures, livelihood strategies (agricultural systems, diversification, and migration), and sustainable livelihood outcomes (improved livelihoods and sustainability). These details are presented in Figure 3.2:

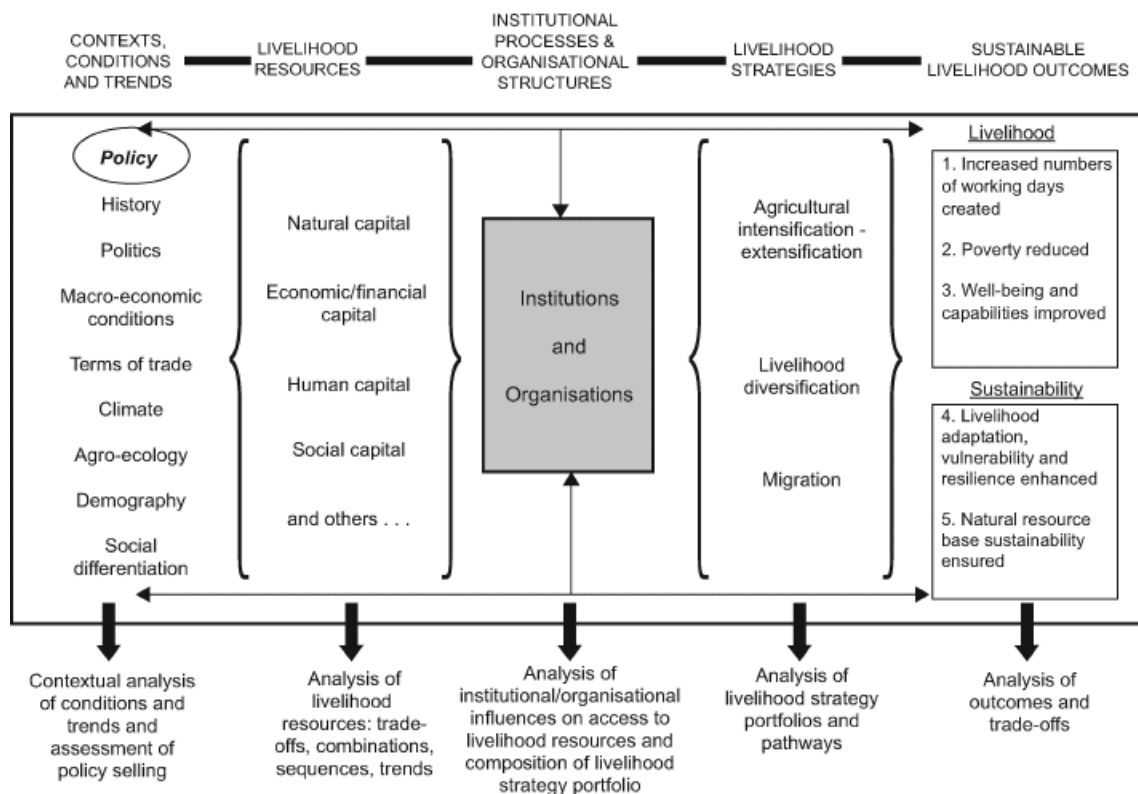


Figure 3. 2 The sustainable livelihoods framework by Scoones (1998)

The framework developed by Scoones (1998) has inspired other development initiatives and research to think about using the concept of sustainable livelihoods. Scoones' work has been developed in order to gain deeper understanding of how rural development policy planning is implemented, and its consequent impacts. The United Kingdom's Department for International Development (DFID UK) is one of the development agencies that has adopted and developed the Scoones' framework in their international aid programmes in developing countries (Batterbury, 2016). The agency has invested a high amount of their budget to develop the framework for both research and development (Batterbury, 2016).

DFID UK (1999) renamed the “approach” a “framework”. This was because the framework is used to plan and evaluate the contributions of development interventions and existing activities to the sustainability of livelihoods (DFID UK, 1999). It provides a map of existing issues and to understand how and why they link to each other (influences and processes that shape livelihoods). Thus, while Scoones (1992) provides what comprises each component of the framework, DFID UK claims to offer an understanding of how and why the sustainable livelihood components interact. The main components of DFID UK model include vulnerability contexts, livelihood assets (five types of capital), transforming structures and processes, livelihood strategies, and livelihood outcomes. The explanation about each component, and the interactions between components, are explained later in section 3.3.3. DFID UK (1999) also claims that the framework is flexible. An analysis does not always start from the vulnerability context; it can start from assets or institutions and link to vulnerability context or to outcomes.

Dorward et al. (2003) added to DFID UK’s sustainable livelihoods framework by highlighting the roles of markets, institutions and technology in relation to poverty reduction initiatives. Slightly different from DFID UK, the framework proposed by Dorward et al. (2003) was designed to be used by practitioners in rural development rather than as a framework for guiding research. However, it does not rule out the possibility that it could be used as a framework to guide research. Dorward et al. (2009) argue that understanding the functions of assets was more important than merely measuring the types of assets owned by a household as was proposed in the original approach. Dorward et al. (2009) believe that by understanding the functions of the assets owned or accessed by a household, rural development practitioners would be better able to help households improve their livelihoods.

The following section describes the sustainable livelihoods framework. First an overview of the framework is provided and then the five main components of the framework are described and defined. Finally, the interactions that occur between the components are described and defined.

3.3.3. *The sustainable livelihoods framework*

This section provides a basic understanding of the concepts which comprise the sustainable livelihoods framework. The framework was designed to help researchers, community development policy makers, and practitioners understand the complexity of livelihoods and the dynamics within the trajectory of a livelihood (Morse & McNamara, 2013). It has evolved since it was initiated by Chambers and Conway (1992), where scholars and development agencies proposed various ways to understand livelihoods and how people sustain their livelihoods. Among the concepts and framework of sustainable livelihoods proposed by experts and development agencies, DFID UK's framework has been adopted and adapted widely for rural development initiatives in developing countries. DFID UK has used this framework consistently for studies and development so that the framework gains more trust from other agencies (Batterbury, 2016).

The sustainable livelihoods framework (Figure 3.3) includes five main components (DFID UK, 1999). These components are connected to six patterns of interaction between components: (1) the impact of the vulnerability context on the livelihood assets, (2) the interactions between the types of livelihood assets and the roles of transforming structures and processes (e.g. government, institutions, cultures, and so on) in the management of assets (3) and how these influence a household's ability to pursue different livelihood strategies (4) in order to achieve livelihood outcomes. The livelihood outcomes can also influence the nature of the assets (e.g. people invest in particular assets when they achieve increased income), and (6) the transforming structures and processes may change the vulnerability context for livelihoods (e.g. development initiatives may improve the vulnerability context). These patterns are described in Figure 3.3. Although the basic components and patterns of the sustainable livelihoods framework developed by DFID UK have been used for decades, the framework has been enhanced as a result of the many studies that have been undertaken in this area. The following sections review the literature on the five important components that make up the sustainable livelihoods framework.

Sustainable livelihoods framework

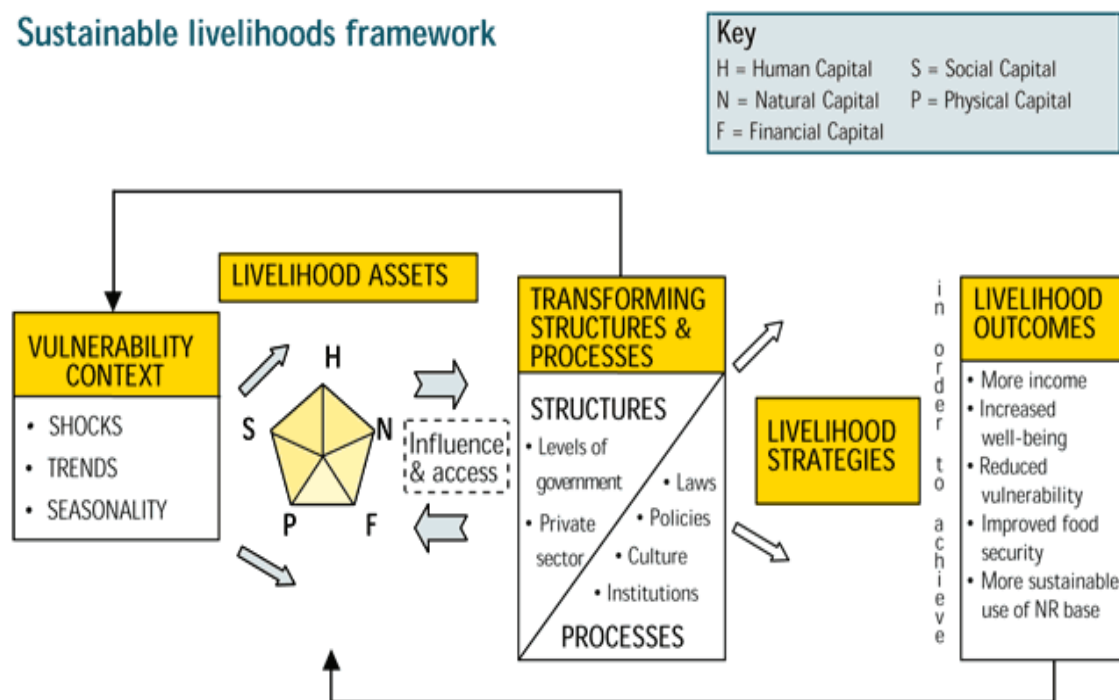


Figure 3.3 The sustainable livelihoods framework. Source: DFID UK,1999; and Elizondo, 2017.

a. Vulnerability context

From the available literature, few scholars provide a brief definition of the concept “vulnerability context” (Figure 3.3). Some scholars define it as external factors or the external environment where people exist, and impacts on rural households’ and communities’ livelihood strategies (Scoones, 1998, 2009; Tao & Wall, 2009; DFID UK, 1999). It is argued that these factors may cause changes or uncertainty in people’s livelihoods (Bonnin & Turner, 2012). Among the scholars who proposed the sustainable livelihoods concept, a brief definition of the “vulnerability context” is provided by DFID UK document (1999, p.3) which defines it as “...the external environment in which people exist. People’s livelihoods and the wider availability of assets are fundamentally affected by critical trends as well as by shocks and seasonality – over which they have limited or no control”. The external influences, or the vulnerability context, can be an event that is happening, but it can also be something that will transpire in the future when people think of ways to anticipate when the change might occur (Morse &

McNamara, 2013). For example, climate change is an external factor which influences people's enterprises such as crop farming, and the sustainable livelihoods framework is used to assess people's mitigation strategies to face the impacts of climate change (Butler et al., 2014).

It is argued that understanding vulnerability context in rural development initiatives has several advantages (Scoones, 1998). Scholars have proposed that understanding the vulnerability context may help in measuring people's capability to cope with external shocks. For example, Chiwaula, Witt, and Waibel (2011) argue that levels of vulnerability exist among people and shape their ability to cope with the external shocks and stresses. Moreover, the scholars also argue that the levels of poverty in a community are related to the level of vulnerability, and that the poorer a group of people, the more vulnerable they are (Chiwaula et al., 2011). It is also argued that access and ownership of livelihood assets influence the level of vulnerability and poverty, and that the most vulnerable and poorest households are those who have the poorest asset portfolios (Chiwaula et al., 2011).

Scholars have proposed that there were several external drivers in the environment where people live which make people vulnerable. Dorward, Anderson, and Paz (2005) argue that rural people are vulnerable because their income is irregular and intermittent, and this is often shaped by seasonality, markets, and labour opportunities. Therefore, rural people are often affected by various changes within the environment such as trends, shocks, and seasonality (DFID UK, 1999; Dorward, 2005; Elizondo, 2017).

Trends, as a form of vulnerability context, include technological, population, or policy tendencies and they can bring about changes in livelihoods and influence people's adoption of strategies to cope with these trends (DFID UK, 1999; Elizondo, 2017), for example, the influence of development interventions to help poor farmers to increase farm production to meet an increase in demand for commodities (Vandamme, D'Haese, Speelman, & D'Haese, 2010). The increasing demand for farm commodities and the provision of development interventions require farmers to adapt to such changes (Vandamme et al., 2010).

Shocks are another form of vulnerability, and are related to incidents that are not anticipated by the farmers, for example, floods or droughts, and socioeconomic shocks such as those that occur due to conflicts and economic recessions (DFID UK; 1999). Examples of shocks include flooding or landslides which damage bridges (physical assets) or rivers (natural assets), which then influence people's livelihood strategies to adapt to the damage or disaster (Morse & McNamara, 2013).

Seasonality is a crucial vulnerability context in many developing countries (Devereux, Sabates-Wheeler, & Longhurst, 2013). Seasonality in the sustainable livelihoods framework refers to regular patterns related to the seasons, for example, the annual changes in seasons, such as the wet and dry seasons that occur in many equatorial countries (Devereux, 2013). Seasonality can influence a number of factors that impact on the livelihood of households such as seasonal variation in employment opportunities, food crop production, and product prices (Elizondo, 2017; Morse & McNamara, 2013; DFID UK, 1999). Seasonality is a source of vulnerability for poor farmers because they need to deal with the seasonal variation in these factors (Devereux, 2013). How well they cope with this is determined by their capability to deal with change (Devereux, 2013). Seasonal changes can make vulnerable people more vulnerable, particularly if rural development initiatives are put in place that do not take into account the problems these farmers face as a consequence of seasonality (Devereux, 2013). The next section reviews the literature about the second component of the sustainable livelihoods framework, "livelihood assets".

b. Livelihood assets

Some scholars believe that livelihood assets are central to sustainable livelihoods (Kent & Dorward, 2012; Morse & McNamara, 2013; DFID UK, 1999). It has been argued that the centrality of livelihood assets is because researchers believe that people need various assets to achieve livelihood outcomes (Morse & McNamara, 2013; DFID UK, 1999). Livelihood assets are the most commonly studied components of the sustainable livelihoods framework. There are various definitions of the concept livelihood assets. Chambers and Conway (1992, p.5), in their definition of the concept stated that assets, together with activities, are a household's means of living. This definition was expanded

by Bebbington (1999, p.22) who said that assets are a means to make life meaningful. Assets are also called capital or capital endowments (Morse & McNamara, 2013; DFID UK, 1999) and capital endowments are defined as people's strengths which are used to achieve outcomes (DFID UK, 1999, sec. 2.3). Some scholars also define assets as internal factors which influence the decisions to choose livelihood strategies (Fang, Fan, Shen, & Song, 2014; Scoones, 2009). Therefore, assets can be understood as means for people to choose and implement livelihood strategies to achieve particular livelihood outcomes. For example, in several studies, the accumulation of assets is related to welfare and the household's ability to increase the production from different enterprises (livelihood outcomes) of rural people in some developing countries (Dorward et al., 2009; Liu et al., 2018; Pour, Barati, Azadi, & Scheffran, 2018).

Some scholars argue that determining the types of assets a household has access to is important in order to understand: 1) the various livelihood strategies a household has chosen for their survival, 2) the reasons behind the achievement of that household's livelihood outcomes, and 3) the reasons why the household uses that specific combination of assets to make a living (Pour et al., 2018; DFID UK, 1999). Some scholars argue that there are tangible assets (e.g. financial or physical capital) and intangible assets (skills and knowledge) (Morse & McNamara, 2013). Scholars also contend that access to assets and the capability to use them are also assets (Scoones, 1998, 2009). In fact, most scholars use a "pentagon of assets" to categorize the types of resources to which a household has access, and this includes: human, social, natural, physical, and financial assets or capitals (Elizondo, 2017; Morse & McNamara, 2013; Scoones, 1998, 2009; DFID UK, 1999). These are reviewed in the following sections:

Human capital. Human capital is defined as the quantity and quality (skills, knowledge, capabilities and good health) of labour available in a household (DFID UK, 1999; Morse & McNamara, 2013; Elizondo, 2017). Mensah (2011) categorises human capital as manpower asset that includes the age structure, family population, gender composition, the quantity of the household, labour force, and so on. Human capital is considered important because it determines how other assets can be managed for better outcomes (DFID UK, 1999). In an example from a case study on cattle farming in Indonesia, it was found that low quality human capital (limited education and skills) has led to poor

livelihood asset management (Budisatria & Udo, 2013; Gayatri & Vaarst, 2015). Gayatri & Vaarst (2015) argue that low quality human capital in the agricultural sector (e.g. a lack of skills and knowledge in forage production, low levels of education in relation to intensive cattle farming or farm management) has influenced rural households' capability to enhance their rural income and well-being.

Social capital. Social capital is defined as “resources available to individuals and groups through social connections and relations” (Turner, 2007, p. 408). The scholar states that social capital can optimize the economic benefits of rural people through non-monetary aspects (Turner, 2007). These concepts are related to how people link or build networks with each other as part of a group or community, and the power relationships that exist among people in the community (Minato, Curtis, & Allan, 2012; DFID UK, 1999). According to some scholars, social capital includes vertical and horizontal networks, associations, formal or informal groups, and relationships built on trust and reciprocity (Elizondo, 2017; DFID UK, 1999). For example, certain private tourism companies in some developing countries were willing to build strong relationships with the local people and this provided them with the full support of these people for their enterprises (Lapeyre, 2011; Stronza, 2010). Moreover, the tourism development provided more opportunities for the local people to increase their income through job opportunities or by selling commodities to tourists (Lapeyre, 2011; Stronza 2010). In these cases, it was found that the private companies maintained a strong network with local people by building trust and ensuring openness with the local communities (Stronza, 2010). Thus, social capital is important in enhancing the livelihoods of people in their communities, and can create additional livelihood opportunities which can result in better livelihood outcomes.

Natural capital. Natural capital is defined as resources that exist naturally in the environment in which households live and work (Elizondo, 2017). Natural capital comprises the natural resources that influence rural livelihoods, including water, soil, biodiversity, and environmental services (DFID UK, 1999; Mensah, 2011). In defining sustainable livelihoods, Scoones (1998; 2009) suggests that, to achieve sustainable livelihoods, natural resources should not be undermined because rural people mainly rely on these resources for their economic activities, especially those that are related to

the agricultural sector. For example, it has been reported that cattle farmers who farm wetlands have higher levels of income from cattle than farmers who farm in dryland environments (Priyanti, Hanifah, Mahendri, Cahyadi, & Cramb, 2012). This is because farmers in wetlands have better access to water which means that they obtain better crop and forage growth than farmers in a dryland environment (Priyanti et al., 2012). Therefore, the farmers can grow out their cattle better and have surplus forage which they can sell in the feed market compared to farmers in dryland areas (Priyanti et al., 2012).

As natural capital is crucial for the livelihoods of rural people, changes in the conditions of natural resources can have a major influence on rural livelihoods (Scoones, 1998; Tao & Wall, 2009). The availability and quality of natural resources are also often beyond human control (Morse & McNamara, 2013). For example, sudden changes or shocks, such as natural disasters (e.g. flooding, earthquakes or sudden seasonal changes) or regular stresses (seasonal changes every year), can impact on the availability and quality of the natural capital rural people access for their livelihood strategies and outcomes (Butler et al., 2015; Tao & Wall, 2009). The sustainable livelihoods framework helps researchers understand the role of natural capital in their livelihoods or rural households and to explore rural people's responses to changes in their natural resources.

Physical capital. Some scholars define physical capital as the infrastructure that supports rural livelihoods (Morse & McNamara, 2013). According to other scholars, physical capital comprises physical infrastructures (buildings or roads), vehicles, and production equipment (tools, machinery, electricity, and communication facilities) (Mensah, 2011; Morse & McNamara, 2013; Tao & Wall, 2009; DFID UK, 1999). Moreover, physical capital is important to support the basic needs of rural people such as school buildings, government offices, sanitation (clean water installation, drainage, toilets, bathing facilities), healthcare, and so on (Stoian, Donovan, Fisk, & Muldoon, 2012). Fischer and Qaim (2012) report that by building a bridge that connects farms or villages to markets, it can shorten the distance and time taken for farmers to travel to markets, and this reduces their transportation costs for marketing their produce.

Financial capital. Financial capital is one of the important assets for rural livelihoods as it is more multi-functional than the other four types of capital (DFID UK, 1999). Financial capital has the financial resources that are used to cope with extreme events, and can be easily exchanged for other types of capital; for example, it can be used to purchase physical capital (Pandey, Jha, Alatalo, Archie, & Gupta, 2017). “Financial capital consists of stocks of money or other savings in liquid form”(Nyamwena-Mukonza, 2013, p. 181) which comprises income, expenditure, or savings (Morse & McNamara, 2013). This capital has different forms such as cash, bank deposits, insurance, financial transfers between countries, or liquid assets such as livestock and jewellery (DFID UK, 1999). Farmers can anticipate the need for money and set up savings in a bank or keep assets that can be easily liquidated such as livestock or gold (Meinzen-Dick et al., 2014). The holding of liquid assets is used as an important savings or insurance strategy by rural people (Meinzen-Dick et al., 2014). The main benefit is that when rural people need cash immediately, liquid assets can be sold easily and converted into cash (Lubungu, Sitko, & Hichaambwa, 2015). Financial capital has a pivotal role in a household’s livelihood because of its ability to be exchanged for other types of capital. Some kinds of financial capital can be exchanged immediately (e.g. cash), but others are not as easily liquidated because they need to be sold first (e.g. selling livestock or land to obtain cash) (The World Bank, 2008). In short, understanding the concept of financial capital gives insight into how cash or other liquid assets are managed in different types of livelihood strategies for different purposes (outcomes).

Asset functions and attributes. Some scholars have identified that just describing the types of capital a household has, is not enough to understand how assets are crucial for sustainable livelihoods (Dorward, 2014; Dorward, Anderson, Clark, Keane, & Moguel, 2001; Dorward et al., 2005; Kent & Dorward, 2015). They maintain that how assets are used to achieve livelihood outcomes can be best understood by knowing the functions and attributes of assets and the role they play in achieving outcomes, as well as knowing why an asset fulfils particular functions (Dorward, 2014; Dorward et al., 2001; Dorward et al., 2005; Kent & Dorward, 2015). Moreover, the attributes of assets are highlighted

by some scholars in order to understand how they fit within the broader livelihood portfolio (Dorward, 2014; Dorward et al., 2005; Kent & Dorward, 2012b)

According to some scholars, asset functions are the roles they play in making a living for a household (Dorward, 2014; Dorward et al., 2009; Kent & Dorward, 2015). According to Kent and Dorward (2015), **asset functions** are also defined as “a nuanced typology of assets that strives to capture the **multiple roles** that natural assets play in livelihoods” (p. 354.) To date, few scholars have explored the functions and attributes of the assets households use for their livelihoods. Some scholars, such as Kent and Dorward, have identified the different functions and attributes of assets (Table 3.1). The “**consumption**” function refers to a direct use value which is attributed to an asset, for example, for the purpose of consumption such as food or medicines (Dorward, 2001; 2005; 2014; Kent & Dorward, 2015). 2) The “**production**” function of assets is closely related to income (Dorward, 2005). Productive assets can contribute to both regular and non-regular income for smallholders (Dorward, 2005). An asset has production function when it produces new resource flows (Kent & Dorward, 2015). For example, livestock has a production function when they produce offspring that can be sold to gain income for farmers (Dorward, 2005; 2009).

Table 3. 1 Functions of assets

No	Dorward (2001)	Dorward (2005)	Kent and Dorward (2015)
1	Consumption	Consumption	Consumption
2	Production	Production	Production
3	Saving	Saving	Saving
4	Buffering	Buffering	Buffering
5	Exchange/Convertible	-	Exchange

6	-	Insurance	Protection
7	-	Social integration	Social

Another function is the “**savings**” function which is associated with the accumulation, saving, and storing of assets over time (Kent & Dorward, 2015, Dorward, 2005). However, Dorward (2005) also includes the “**protection**” or “**insurance**” functions of an asset in rural livelihoods as a savings function because insurance or protection is also associated with the accumulation of assets. An asset that acts as a form of savings can also be considered a form of insurance as it can be liquidated to provide cash after an unexpected event or shock (Dorward, 2005; Kent & Dorward, 2015).

The “**exchange**” function of an asset is where an asset can be changed into other forms, which are associated with income and savings (Kent & Dorward, 2015, Dorward, 2005). For example, a cattle beast can be sold for income (Dorward, 2005), or gold could be sold to purchase livestock (Kristjanson, 2014). 5) An asset has a **buffering** function or, what some refer to, as a consumption smoothing effect when it is stored and accumulated during periods when the amount of asset a farmer owns exceeds their needs for consumption. It can then be stored and used when the asset is in short supply (Dorward, 2005). Scholars also consider the buffering function as a part of the savings and protection, or insurance functions, because it is similar to the strategy of storing and accumulating assets in anticipation of future hardships (Kent, 2012b). The “**social**” function of an asset refers to the value associated with an asset that influences the relationships among people in society (Kent & Dorward, 2015; Wangchuk, Wurzinger, Darabant, Gratzner, & Zollitsch, 2014). An asset may have a role as a symbol of pride (Wangchuk et al., 2014), or it may be a means individuals use to build a relationship with other people in their society (Curry, Koczberski, Lummani, Nailina, Peter, McNally, & Kuaimba, 2015; Bettencourt, Tilman, Narciso, Carvalho, & Henriques, 2015).

In rural livelihoods, an asset usually fulfils different roles in different activities (Dorward, 2009). How an asset fulfils its different functions in different contexts is explained through the attributes of the asset (Kent & Dorward, 2012a; 2015). Several

studies have reported how a particular asset fulfils different roles in a smallholder farmer's livelihood. They report that an asset fulfils multiple functions such as a means for saving, a source of regular income, or a means of building social relationships (Ng'ang'a, Ritho, Herrero & Fraval, 2016; Neudert, Goetter, Andriamparany, & Rakotoarisoa, 2015, Bettencourt et al., 2015). An asset is also considered a means for regular income as well as for saving and consumption (Dorward, 2009; De la Martiniere, 2010). In order to make decisions on how to use an asset, there are some attributes of an asset that enable it to fulfil particular functions (Kent & Dorward, 2015, Dorward, 2005). For example, in many rural communities, assets such as livestock or cattle are considered a means of saving, like savings in a bank, because the attributes of livestock mean that they are productive and relatively easy to liquidate (to be converted into cash) (Dorward, 2001; 2005; Patrick, 2010; Wangchuk et al., 2014; Ngigi, 2015; Mogue, 2011). The types of asset attributes have been identified by Dorward (2005) (Table 3.2).

Table 3. 2 Attributes of assets

Types of attributes	Explanation
Productivity	'Normal' productivity; sensitivity to and resilience under different conditions
Complementarity	Does use of this asset require other assets to achieve value? Does the use of this asset preclude the use of other assets/livelihood activities?
Convertibility	Exchange costs. How easy it is to convert this asset into cash or other investment or consumption resources?
Substitutability	Can the services provided by this asset be substituted by another?
Social value	Does the holding/use of this asset confer/reduce social status or other social capital? Does it contribute to

	identity, group belonging, heritage?
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Source: Dorward et. al. (2005)

The attributes in Table 3.2 are some of the examples provided by Dorward et. al. (2001; 2005) and are useful for analysis in the present study. **Productivity** is an attribute that is related to functions of production and income, which enable an asset to generate production flows (Dorward et. al., 2005). The produce can be sold again to gain income (Dorward et. al., 2005). Understanding this attribute helps a researcher to understand why an asset is chosen to fulfil particular functions, and how farmers make decisions based on the productivity characteristics attributed to an asset (Dorward et. al., 2005). **Complementarity** refers to the characteristic that is about the relationships between different assets which fulfil the same functions (Dorward et. al., 2005; Dorward, 2014; Kent & Dorward, 2015). For example, does the use of one asset require the use of other assets to achieve value? Alternatively, does the use of one asset preclude the use of another?

Convertibility is the characteristic of an asset that is related to its exchange function, that is, its ease of conversion into cash, or other types of assets (Dorward et. al., 2005; Kent & Dorward, 2015). This attribute helps researchers and community development agencies compare which assets are the ideal types to fulfil the most efficient function and to understand why smallholder farmers use particular strategies to manage their assets based on the assets' ability to be liquidated (Dorward et. al., 2001; Dorward et. al. 2005; Patrick, 2010; Wangchuk et al., 2014; Ngigi, 2015; Mogues, 2011)

Substitutability refers to the ability of one asset to substitute for another asset that has the same function (Dorward et. al., 2005; Kent & Dorward, 2015). Sometimes, farmers face several choices in their livelihoods and how they choose one asset over other assets is often based on this attribute (Dorward et. al., 2005). **Social value** refers to the attribute of an asset that has social function (Dorward et. al., 2005; Kent & Dorward, 2015).

Scholars have also reported that the attributes and functions of an asset are different in different societies, groups, or cases (Kent & Dorward, 2015, Dorward, 2014). They

argue that, based on this, the attributes must be context-specific (Kent & Dorward, 2015).

c. Transforming structures and processes

DFID UK (1999) and Elizondo (2017) used the terms “Transforming Structures and Processes” for this component of the framework. The Transforming Structures and Processes influence the use of assets and the selection of certain livelihood strategies in order to achieve certain outcomes (Elizondo, 2017; Mensah, 2011; DFID UK, 1999). That is why scholars consider that the transforming structures and processes are central components of the sustainable livelihoods framework (Murugani & Thamaga-Chitja, 2018; Neilson & Pritchard, 2009) together with the livelihood assets (Pokharel, 2010).

Transforming structures and processes are divided into two components. First, transforming structures are perceived as “the hardware – the organisations, both private and public – that set and implement policy and legislation, deliver services, purchase, trade, and perform all manner of other functions that affect livelihoods” (DFID UK, 1999, sec. 2.4.1.). Second, transforming processes or the software parts shape how structures or organizations and individual work (DFID UK, 1999). Types of software include policies and legislations which are set up by organizations, institutions, and culture (DFID UK, 1999).

Institutions. Institutions are defined in different ways such as “the ‘rules of the game’, ‘standard operating practices’, ‘routines, conventions and customs’ or ‘the way things are done’.” (DFID UK, 1999, sec. 2.4.2.). These comprise both the formal and informal institutions (Mensah, 2011). Formal institutions are definite policies, rules, or regulations which have fixed guidelines (Debnath, 2018), whereas informal institutions “are upheld by mutual agreement among the social actors involved or by relations of power and authority between them” (Debnath, 2018, p. 26), and comprise social norms and traditions (Mensah, 2011). For example, in several studies in Asian and African countries, scholars found that gender norms (the transforming structures and processes) shaped men and women’s access to certain livelihood assets (e.g. men had better access to farmland than women) and development interventions (e.g. men had

better access to development aid than women) because social norms view men's and women's roles and rights differently (Kristjanson et al., 2014; Quisumbing, Roy, Njuki, Tanvin, & Waithanji, 2013). Accordingly, understanding the formal and informal institutions that make up the Transforming Structures and Processes in the sustainable livelihoods framework, is critical for understanding why smallholder farmers manage their enterprises in the way that they do.

In relation to the complexity of the concept of sustainable livelihoods, particularly in market-led rural development in developing countries, social norms have been found to be important in understanding the livelihood strategies of rural households. Markel et al. (2016) argue that development interventions often overlook social norms, and that this often results in conflict among the smallholder farmers who are involved in these development programmes. On this basis, several scholars have argued that social norms need to be considered in sustainable livelihoods research (Daskon & Binns, 2010; Neilson & Shonk, 2014). Owing to the emerging importance of social norms in relation to the success or failure of development initiatives, the following section reviews the high-level theory on social norms.

Social norms. Scholars have defined social norms in different ways. They are defined as the shared cultural understanding among a group of people on how to behave (Frese, 2015; Markel et al., 2016; Minato et al., 2010, 2012), and also as the informal and unwritten rules which govern relationships among people and include what we expect others to do or what others expect us to do (Young, Evans-Kocinski, Bush, & Windsor, 2013). Social norms are accepted in society and become the internal values of individuals as well as the external forces that determine how individuals are expected to behave based on local values (Frese, 2015; Markel et al., 2016; Minato et al., 2010, 2012; Young et al., 2013). They are also defined as forms of informal institutions that emerge and develop as a consequence of the process of the natural interactions that occur during social life (Bicchieri, 2006; Wallace, 2009). Norms evolve in response to a range of external factors (Ellickson (2001) such as by government policy (new rules and regulations), variations in environmental conditions, trendsetters developing new ways of behaving, differences within different social groups, or development in scientific information (Bicchieri and Mercier, 2014; Ellickson, 2001).

Scholars divide the types of norms into two according to how the norms are implemented and the implications of the norms. Those are *injunctive norms* and *descriptive norms* (Minato et al., 2010; Frese, 2015). *Injunctive norms* are shared perceptions that can be driven from shared personal values (morally right or wrong) and the violation of the norm will lead to social sanctions (Minato et al., 2010; Frese, 2015). Social sanctions vary across communities. When people do not follow the local norms, they can receive negative comments, be gossiped about, or be harassed verbally or physically as different forms of social sanctions (Baker, Olubode, Tanimola, & Garshelis, 2014). On the other hand, *descriptive norms* are shared perceptions about common practices or behaviours that do not attract social sanctions if an individual is not behaving as expected in their social group (Frese 2015; Markel et al., 2016; Young, 2015). In real life, although people may or may not receive social sanctions if they do not do what their community expects them to do, they are aware of the risks of not obeying the 'unspoken rules' in their society (Baker et al., 2014; Markel et al., 2016; Young, 2015). Sometimes, people do not know why they follow these common rules of behaviour, particularly if the rules do not attract a social sanction (Minato et al., 2010). However, people feel more comfortable when they follow these unwritten rules (Minato et al., 2010). Individuals continue to follow descriptive norms in order to conform to common practices and to avoid feeling alienated by others (Frese, 2015). That is because people feel more comfortable living in a certain society where their behaviour fits with the local social norms (White, Smith, Terry, Greenslade, & McKimmie, 2009). Moreover, when particular social behaviours become routine, then people will often consider them to be common practices and norms (descriptive norms) (Frese, 2015).

In terms of development initiatives, scholars suggest that development initiatives should be socially and culturally sensitive and take into account existing social norms (Daskon & McGregor, 2012; Baker et al., 2014). Development initiatives should consider the existing social culture as there may be some traditional rules (norms) which may influence whether or not a new development intervention will be successful (Baker et al., 2014). When interventions do not align with existing social norms, often people do not maintain the expected changes that are being fostered by a particular development intervention; instead, the people keep returning to their original practices (Amede &

Sanginga, 2014). It is also argued that culture and social norms are dynamic and that they can be adapted and transformed over time to fit the complexities of people's lives and the on-going changes to which they are exposed (Baker et al., 2014). However, such changes are social processes and take time (Cochrane, 2006; Daskon & McGregor, 2012).

Gender norms. Several experts take account of gender norms in the implementation of rural development initiatives. This includes the local society's views about the roles of men and women in their livelihoods (Quisumbing et al., 2013; Smith, 2015). The traditional norms in many rural societies in developing countries, place expectations on women to undertake the domestic chores while men do "outside" work or take up public roles (Smith, 2015).

Gender norms that set out society's expectations about the different roles men and women play are important when implementing rural development initiatives. Although the awareness of gender has been raised in rural development initiatives, there is still a lack of understanding about the influence of social norms, particularly in relation to the different roles that men and women adopt in society (Markel et al., 2016). Although development initiatives have focused on women's empowerment and provided a wide range of opportunities for rural women to participate in public activities (e.g. attending training, being assisted in marketing, and so on), research has shown that women are still hesitant to participate in such activities (Markel et al., 2016). Therefore, development initiatives need to recognise the existing social norms that play out in shaping rural livelihood strategies in order to understand why people carry out their livelihood strategies in the way that they do.

d. Livelihood strategies

Livelihood strategies are the fourth component of the sustainable livelihoods framework (Scoones, 1998). A livelihood strategy is defined as the range or combination of livelihood activities that are used by a household to achieve livelihood outcomes (DFID UK, 1999; Tao & Wall, 2009). According to some scholars, livelihood strategies are a range of options and activities to make use of assets with the mediation of institutions to achieve livelihood outcomes (Diniz, Hoogstra-Klein, Kok, & Arts, 2013;

Scoones, 2009). Dorward et al. (2005) build on the original definition of livelihood strategies and define them as “ ...the way that asset and activity functions and attributes relate to people’s reliance on particular asset and activity mixes” (p. 9).

Rural people pursue different livelihood strategies based on the assets that they have available to them to sustain their livelihoods (Scoones, 1998; Tao & Wall, 2009). Some authors have maintained that poor asset endowment may limit farmers’ livelihood strategies in regard to attaining better outcomes (Dorward et. al., 2009; Mensah, 2011). According to Scoones (1999), in rural livelihood strategies, people have a range of options of agriculture activities (including farming in crop, livestock, agroforestry, and so on), non-farming activities, diversification (mix on-farm and/or off-farm activities), or migrating. Agricultural intensification is maximizing production per unit area through increasing capital and labour inputs, while agricultural expansion is increasing production through expansion of land (Scoones, 1999). Dorward et. al. (2005) and Dorward et. al. (2009) propose different clusters of livelihood strategies based on the assets available to rural people and the activities in which they engage. The types of livelihood strategies include hanging-in, stepping-up, and stepping-out. Hanging-in is when assets and activities are addressed for the livelihood survival, stepping-up aims to increase livelihoods, and stepping-out is accumulating assets for more stable livelihoods (Dorward et. al., 2009).

e. Differentiating assets, enterprises, income activities, or strategies

The terms assets, enterprises, livelihood activities, and livelihood strategies are often used interchangeably. However, it is important to differentiate between these terms. For example, an asset is a form of capital that can be accessed or owned by people to help them live (Morse & McNamara, 2013). In contrast, an enterprise is a business that is managed to generate income (Fox, 2012).

In the literature, the term ‘enterprise’ is different from the term ‘livelihood activities’. While enterprise is a business organised -by an individual or a group- to generate income, livelihood activities may include any activity to achieve livelihood outcomes. The livelihood activities here refer to whether doing income generating activities such as working as an employee or a labour unit within an enterprise, or doing non-

commercial activities (Jha, 2019; Fox, 2012). On the other hand, livelihood strategies are a range of options of livelihood activities to achieve livelihood outcomes (DFID UK, 1999; Scoones, 1998; Liu, et. al., 2012; Diniz, Hoogstra-Klein, Kok, & Arts, 2013). Therefore, the use of particular terms is contextual in this study, depending on the perspective of a discussion. Something can be referred to as an asset, enterprise, livelihood activity or livelihood strategy, depending on the context of the conversation.

f. Livelihood outcomes

Livelihood outcome is a component of the sustainable livelihoods framework that is defined as the outputs that result from the livelihood strategies used by a household (DFID UK, 1999; Elizondo, 2017). This definition has been used by other scholars such as Bonnin & Turner (2012) and Dorward et al. (2009). According to DFID UK (1999, p. 2.6.), analysing the outcomes generated by a household helps a researcher understand: “(1) the ‘output’ of the current configuration of factors within the livelihoods framework (a first step to understanding the nature of causality); (2) what motivates people to behave as they do; (3) what their priorities are (as a basis for planning support activities); (4) how they are likely to respond to new opportunities; and (5) which performance indicators should be used to assess support activities.”

Through the sustainable livelihoods framework, scholars can examine the relationship between outcomes and other components of the framework. The scholars report that outcomes have a close relationship with asset endowment, institutions, and livelihood strategies. Some scholars report that households with an adequate asset endowment responded better to market-led development initiatives (better livelihood outcomes as the impact of the initiatives) than those who are poor and had a limited asset endowment (Budisatria & Udo, 2013; Devaux et al., 2018). The literature reports on the relationship between smallholder farmers’ wealth and their responses to development initiatives. The wealth of smallholder farmers contributes to their capability to participate in development interventions and become more commercial because they are not struggling to fulfil their basic needs in contrast to poor farmers (Devaux et al., 2018). Devaux et al. (2018) believes that better-off farmers are more able to use the

assistance provided by development interventions to support their production, while poor farmers are more focused on fulfilling their basic consumption needs.

3.4. The empirical literature on sustainable livelihoods in shaping management of an asset or enterprise

This study sets out to answer the research question - “What shapes smallholder farmers’ decisions on management of their cattle in an area where cattle development is being promoted by market-led rural development initiatives?” The empirical literature on rural livelihoods relevant to this research question is reviewed in the following sections. The review is structured into three main sections. Section 3.4.1 reviews studies around the role of relative wealth in shaping smallholder farmers’ management of an enterprise. Section 3.4.2 reviews literature on the functions and attributes of assets and how they shape the management of an enterprise. Section 3.4.3 reviews literature around the roles of formal and informal institutions in shaping management of a smallholder enterprise. Although the focus of this study is on cattle management, the review also covers studies on crop and other livestock enterprises where they contain material relevant to the study.

3.4.1. *The role of relative wealth in shaping smallholder farmers’ management of an enterprise*

Pacheco (2009) reports that the wealthier a household, the higher the ability to accumulate assets. However, the type of assets accumulated varies according to social norms, for example, in several communities in Brazilian Amazon (Pacheco, 2009) or in Bhutan (Wangchuk, 2014) wealthier households invest more in cattle because they are a symbol of wealth in these communities. On the other hand, in several African countries, the symbol of local wealth is livestock, to which the households are primarily oriented by increasing the number of livestock as a form of accumulation of their assets (Ng’ang’a et al., 2018; Neudert et. al., 2015). Scholars in rural Kyrgyzstan also report a positive relationship between wealth and aspirations to develop wealth through commercial activities (De la Martiniere, 2012). It is identified in the literature that the wealthier a smallholder farmer is, the greater their motivation or inspiration to be involved in more commercial farming activities (De la Martiniere, 2012).

Several studies reported that there is a relationship between diversification of livelihood incomes, levels of wealth, and the ability to manage an enterprise (Pacheco, 2009; Milestad, Dedieu, Darnhofer, & Bellon, 2012). Scholars report that households that have diversified income activities are wealthier and able to manage an enterprise better than households that only focus on one enterprise (Pacheco, 2009; Neudert et al., 2015, Ng'ang'a et al., 2018). However, Milestad et al. (2012) advises that levels of diversification of income sources are limited. The diversification will be effective as long as there is a trade-off between strategies and that one strategy is able to balance other strategies (Milestad et al., 2012).

In addition, Kent and Dorward (2012b) state that the determinants of livelihood outcomes (e.g. being wealthier, increased well-being, or increased income) are not only related to the size of the portfolio assets held but they are also related to how these portfolio assets function in mixed activities in livelihoods. Thus, there is a link between asset portfolios in fulfilling various functions in livelihoods and the ability to make rural people less vulnerable or better-off (Dorward et al., 2009). Moreover, the condition of asset portfolio and their functions determines how a household managed their enterprise (Dorward et al., 2009). For example, it is reported in Mexico that households can make their enterprise (e.g. livestock) more commercial and the household will be wealthier if the asset portfolio and activities allow for more than just surviving (Dorward et al., 2009).

3.4.2. The functions and attributes of assets and how they shape the management of an enterprise

Two aspects related to the functions of a household's assets shape the management of an enterprise (Dorward et al., 2001; Dorward et al., 2005; Kent & Dorward, 2015). First, the functions of an asset influence the management of an enterprise or livelihood activity (Dorward et al., 2001; Dorward et al., 2005; Kent & Dorward, 2015). Second, the attributes of an asset shape the management of an enterprise (Dorward et al., 2001; Dorward et al., 2005; Kent & Dorward, 2015). These are discussed in the following sections.

a. How the functions of an asset influence the management of cattle

Scholars have identified that an asset can have a mix of functions within a household (Bettencourt et al., 2015; Dorward et al., 2009; Wangchuk et al., 2014). In the literature about rural livelihoods in developing countries, it is reported that the functions of cattle as an asset can vary depending upon the context (Kent & Dorward, 2015). It has been shown that in several Asian countries that the functions of livestock, including cattle, include savings, insurance, consumption, production, and social-relations building (Bettencourt et al., 2015; Dorward et al., 2009; Wangchuk et al., 2014). In the case of dairy cattle farming in Mozambique, it was reported that cattle fulfil a range of functions including acting as a source of financing expenditure or production, a source of draft power for food crop farming, a means of saving and insurance (Ng'ang'a et al., 2018). Importantly, these farmers did not consider that cattle were important in relation to the consumption (meat or milk) function (Ng'ang'a et al., 2018). On the other hand, drawing on an eastern Amazon case study, Siegmund-Schultze, Rischkowsky, and King (2011) state that livestock is not an ideal means of insurance because they are exposed to risks such as being lost in the grazing area, or becoming sick or dying. However, these scholars only looked at the savings and insurance functions of cattle. In contrast, other scholars have reported that assets can have more than one function and that these functions can shape farmers' decisions to invest in a particular asset (Dorward et al., 2009; Kent & Dorward, 2015; Kent & Dorward, 2012b). The multiple functions of an asset are viewed as a benefit by farmers and this is one of the important reasons why farmers keep such assets (Dorward et al., 2009; Kent & Dorward, 2015).

It is reported that people use their assets for different functions in different conditions or circumstances (De la Martiniere, 2012; Dorward et al., 2009). These studies (De la Martiniere, 2012; Dorward et al., 2009) found that the functions of livestock are related to the decisions to sell or consume them, and these decisions are a function of the relative wealth of smallholder farmers. For example, wealthier smallholder farmers are more likely to use cattle for exchange rather than for consumption (De la Martiniere, 2012; Dorward et al., 2009).

In the literature, the way livestock, including cattle, are used depends on the age of the livestock, the prevailing social norms, and the labour that is available for farming (Ng'ang'a et al., 2018; Wangchuk et al., 2014). Ng'ang'a et al. (2018), in a case study in Africa, report that smallholder farmers usually sell their older cattle for meat and replace them with younger cattle, so the age of cattle dictated their function. Keeping livestock (including cattle) as a supporting income is a social norm which is shared among people in the societies being studied in Africa Mozambique (Ng'ang'a et al., 2018) and Bhutan (Whangcuk et al., 2014). For example, livestock were rent out for draft power or smallholders sold milk from the dairy cattle in order to earn income, but they were not considered the main sources of income (Ng'ang'a et al., 2018; Wangchuk et al., 2014). In those studies, livestock were also a symbol of wealth, where the rich smallholders accrue their wealth through accumulating livestock (Ng'ang'a et al., 2018; Wangchuk et al., 2014). In contrast to the African study, Wangchuk et al. (2014) found that smallholder farmers in Bhutan may decide to sell their cattle when their labour supply is not sufficient for them to manage their cattle.

Studies (Challies & Murray, 2011; Donovan & Poole, 2013; Lisson et al., 2010) note that development initiatives often focus on the income, production and exchange functions of an enterprise as well as the formal institutions that shape the production and marketing of the enterprise. However, few studies have reported the existence of the influence of informal institutions that are embedded in decisions related to the management of the enterprise. In several studies about cattle and non-cattle (livestock and raspberry), scholars report that these commodities are reliable sources of income for households because markets are available for the commodities and the demand is continued over time (Challies & Murray, 2011; Donovan & Poole, 2013; Lisson et al., 2010). To support the production of these commodities, the scholars identified that there were various initiatives that were delivered to enable the smallholder farmers to increase their capability to access markets (supporting production and exchange functions) (Donovan & Poole, 2013). However, the development initiatives often failed to achieve their goals because of their absence in acknowledging the embedded informal institutions in shaping farmers' management of their farm enterprises (Neilson & Shonk, 2014). Based on a study in Indonesia, Neilson & Shonk (2014) suggest that to

understand the decisions of smallholder farmers, one must also consider both the informal institutions and the other non-production and non-marketing functions of assets such as social and cultural functions.

b. How the attributes of an asset influence the management of cattle

Attributes are the characteristics of an asset that fulfil particular functions (Dorward, 2014; Kent & Dorward, 2012a; Schoch, Steimann, & Thieme, 2010). Some authors (Dorward, 2014; Kent & Dorward, 2012a; Schoch et. al., 2010) have identified the attributes of different assets in a household's livelihood in order to understand the relationships between the household's different assets.

In some quantitative studies, the attributes of an asset are calculated based on the contribution an asset makes towards the needs of the household. For example, a study in Indonesia reported the percentage of the total income that was provided by goats, cattle and poultry for a smallholder household (Ashley et al., 2018; Leslie, Geong, Abdurrahman, Ward, & Toribio, 2015). From this calculation, they could identify which commodities or enterprises were the most profitable economically and socially in a household (Ashley et al., 2018; Leslie et al., 2015). However, the studies do not explore how the functions of these commodities are related to each other.

Some scholars used the concept of attributes to understand where an asset sits within the broader context of a household's livelihood portfolio (Dorward et. al. 2005). That is because attributes help explain the relationships between assets based on the functions they have (Dorward et. al., 2005). Scholars explored the attributes of an asset that explain: a) when the functions of an asset change, b) the reasons why the functions of an asset change, and c) the implication to the management of the asset in a livelihood (Kent & Dorward, 2015). Kent and Dorward (2015) and Schoch et. al. (2010) inform that the attribute of cattle changed from being the main source of income into becoming a means for saving when smallholder farmers adopted off-farm income activities which were more profitable than their on-farm activities. Schoch et. al. (2010) argue that different livelihood activities compete for labour and so the farmers had given up the less profitable activity to provide labour for the more profitable activity. This may become a means to accumulate further wealth.

In short, there are examples of studies that explored the relationship between the functions and attributes of assets that shape how the assets or activities are managed. It is also reported that the functions and attributes of an asset are different in different cases or societies (Kent & Dorward, 2015). From the literature, it is argued that those differences are socially constructed and often influenced by institutional aspects (Kent & Dorward, 2015). The influence of institutions (formal and informal) in shaping management of an asset is explored in the following section.

3.4.3. *The roles of formal and informal institutions in shaping management of a smallholder enterprise*

Many studies discuss the influence of formal and informal institutions in shaping management of an enterprise. In this section, the literature being reviewed relates to the influence of institutional aspects (formal and informal) and the management of cattle or non-cattle enterprises in rural livelihoods.

a. *The roles of formal institutions in shaping management of an enterprise*

In regard to the formal institutions influencing smallholders' management of an enterprise, especially cattle, scholars have explored the role of the institutions in production and marketing (Pour et al., 2018; Murugani & Thamaga-Chitja, 2018; Lisson, et al., 2010; Leslie et al., 2015; Patrick, 2010). From previous research, there are several aspects that have been explored in relation to the role of formal institutions such as development interventions, farmer groups, training or education, and finance.

The literature reports on the impact of formal institutions such as development interventions in promoting the adoption of innovations and increasing smallholder production of a commodity. Several studies related to cattle have examined the implications of development interventions by development agencies (formal institutions) in changing farmers' practices from traditional to more intensive methods to increase production (Leslie et al., 2015; Setianto, Cameron, & Gaughan, 2014; Setianto, Hidayat, & Yuwono, 2019). According to the literature, the reasons why smallholder farmers respond positively to the introduction of technological innovations

as a part of a development initiative vary between individuals. Lisson et al. (2010) report that many cattle farmers in their study adopted the technological innovations because they would reduce production costs and labour and increase income. Other scholars also believe that farmers' adoption of innovations is shaped by a network or platform of various stakeholders that work together to bring about practice change (Pamuk, Bulte, & Adekunle, 2014).

The formal institutions also play a role in capacity-building of farmers in production and marketing, for example by providing trainings and education (Murugani & Thamaga-Chitja, 2018). It is noted that in marketing, farmers need different skills from production (Murugani & Thamaga-Chitja, 2018). It is reported that different types of trainings on production and marketing for smallholder farmers enable the farmers to increase production and sustain their participation in markets (Murugani & Thamaga-Chitja, 2018)

The other literature investigated the role of formal farmers groups as the intermediate institutions to help the implementation of development initiatives for smallholders (Swaans, Boogaard, Bendapudi, Taye, Hendrickx, & Klerkx., 2014; Patrick, 2010). There are farmer groups that help their members to increase the production of their enterprises, for example, in a case of cattle in NTB, their role is to help distribute assistance (cattle) from the government to smallholder farmers in the groups so that the implementation of the government initiative is more effective and efficient (Patrick, 2010). A study by Doumbia, van Paassen, Oosting, and van der Zijpp (2012) studied the roles of an innovation platform as an institutional aspect that shapes the production of a commodity, and fosters the adoption of innovations. However, quite often these can be top-down methods and do not focus on solving the livelihood problems for smallholders because they are enterprise (e.g. cattle) specific. The scholars report that good collaboration between development agencies and group of farmers may solve problems in delivering services to increase farmers' production (Doumbia et al., 2012). For the smallholder farmers, the government assistance helps them to reduce the production cost, and joining farmer groups, enabling them to access supports for their cattle enterprise (Patrick, 2010).

Studies identified that formal institutions helped smallholders to access markets (Gyau, Franzel, Chiatoh, Nimino, & Owusu, 2014). Few studies have been reported relating to cattle or livestock, however, there are several scholars who have reported on other commodities. For example, in a case study of Banana marketing in Kenya (Fischer & Qaim, 2012), or agroforestry in Cameroon (Gyau et al., 2014) it was stated that the role of groups or cooperatives of farmers is to ensure the quality of commodities so that they will be able to enter markets (Fischer & Qaim, 2012; Gyau et al., 2014).

Financial support is important in the production and marketing of an enterprise stakeholder (Pour et al., 2018; Murugani & Thamaga-Chitja, 2018). The support can be accessed through formal credit institutions (e.g. banks), especially when the farmers need a high amount of money for production or marketing (Murugani & Thamaga-Chitja, 2018). However, poor-farmers have had difficulties in accessing the financial support from formal institutions because the credit services that could be accessed and the capability to access formal credits were limited when they required collateral (Pour et al., 2018; Murugani & Thamaga-Chitja, 2018). Therefore, in order to deal with limited access to such a formal institution, the smallholder farmers may form a formal, local credit group that enables each of the members to have access to the funding (Pour et al., 2018).

b. The roles of informal institutions in shaping management of an enterprise

Besides exploring formal institutions, the literature has also reported the influence of informal institutions in shaping management of an enterprise. Some of the studies are related to cattle and some are with non-cattle. Research has also examined the role of mixed formal and informal institutions in relation to management of an enterprise.

The relationships between intensive farming systems, production and participation in markets have been highlighted. Donovan and Stoian (2012) argue that the intensive farming systems can increase production, and improve and sustain market access. These scholars also argue that intensive farming systems require a higher level of inputs, the adoption of innovations, and a commercially oriented farming approach (Donovan & Stoian, 2012). However, intensive farming systems can help smallholder

farmers improve their profitability and increase their income through improved access to sustainable markets (Donovan & Stoian, 2012). Other literature also indicates that high market demand and ready access to markets may motivate smallholder farmers to produce more and better quality products because they now have access to a reliable and profitable market (Stür, Khanh, & Duncan, 2013).

Scholars have also noted the relationship between cultural norms, traditions and farmers' decisions about either the production or marketing of a commodity (Petersen, Moll, Hockings, & Collins, 2015; Waldron et al., 2013). It is reported in a study in Cape Town that cultural traditions have influenced the demand for traditional medicines (Petersen et al., 2015). Markets for specific commodities have formed around these cultural traditions and shaped smallholder farmers' motivation to produce the commodity in order to access these markets (Petersen et al., 2015). In relation to cattle, Waldron et al. (2013) explored the relationship between culture and market trends. He reports that particular religious events (e.g. Eid Adha) influence the demand and price of male or female cattle depending on the types of cattle needed for each celebration (Waldron et al., 2013).

Different gender roles in the public and domestic spheres of life restrict a particular gender in terms of their ability to increase the production they obtain from their livelihood activities and their access to markets (Mersha & Van Laerhoven, 2016; Markel et al., 2016). Such restrictions are normally faced by women in patriarchal societies in developing countries (Mersha & Van Laerhoven, 2016; Markel et al., 2016). Women face a double burden in developing countries when they are the target of formal development interventions because, although these women have been provided with rights to access public services, they still have to undertake the domestic chores of the household which limits their ability to take advantage of the development intervention (Markel et al., 2016).

On the other hand, some scholars claim that rural development agencies need to be more focused on encouraging farmers' participation in development interventions (Gayatri & Vaarst, 2015; Curry et al., 2015). These scholars suggest that development initiatives should focus on the approach (participatory approach) rather than focusing

only on outcomes such as introducing innovations, as the outcomes are often quite different from what were expected (Gayatri & Vaarst, 2015; Curry et.al., 2015). It is argued that the goal of introducing intensive farming systems or innovations may inhibit farmers' positive responses to the new farming system if the approaches are not compatible with their traditional farming practices, sociocultural values, and local livelihoods (Curry et al., 2015). Farmers are resistant to change and prefer to use their traditional farming systems because the social norms associated with these traditional practices are strongly embedded in their economic activities, and these are often not compatible with the introduced innovations (intensive farming systems) (Curry et.al., 2015). It is reported that traditional knowledge and practices are more suitable for growing indigenous commodities (Hongsong and Yunyue, 2017). In addition, the literature contends that because local farmers are more familiar with their indigenous farming systems, they can generate a higher level of profit than they could gain from introducing outside technologies.

Scholars provide several other examples of where development initiatives incorporated local institutions into development initiatives so that rural people are more likely to accept the initiatives (Patrick, 2010; Swaans et. al., 2014; Lestari & Triwahyuni, 2014; Gayatri & Vaarst, 2015). For example, local shared cattle farming systems were adopted by a development initiative in Indonesia to help smallholder local farmers deal with financial difficulties to enhance the number of their cattle (Lestari & Triwahyuni, 2014; Gayatri & Vaarst, 2015). The approach was reported successful in achieving its goal (Gayatri & Vaarst, 2015). In relation to cattle, Patrick (2010) found that a development initiative (e.g. in increasing smallholder cattle production) will be more effective by approaching local leaders to enhance targeted people's trust toward a development initiative and to respond positively to the initiative (Patrick, 2010). However, there is little information from the studies of why accommodating local institutions worked, or did not work, for the targeted people.

The way in which gender norms shape men and women smallholder farmers' decisions in relation to a particular livelihood asset or activity, has been reported in the literature. One of the definitions of gender norm being used here refers to "...different norms apply to men and women, and that they impact men and women in different ways, particularly

in regard to their engagement in economic activity” (Markel et al., 2016). Gender norms are often embedded so deeply in a society that they are not even questioned by the members of that society (Mersha & Van Laerhoven, 2016). Women have to obey the rules and accept the reality that particular norms are applied to them and restrict their movement or behaviour in a society (Mersha & Van Laerhoven, 2016).

Examples have been provided of the influence of gender norms to barriers and experiences faced by men and women in production (Mersha & Van Laerhoven, 2016; Kristjanson et al., 2014). It is reported that men- and women-headed households have different informal institutional issues which shape their farm production (Mersha & Van Laerhoven, 2016). In a study in Ethiopia, poor female households were excluded from reciprocal labour exchange arrangements in crop farming because of the restricted norm in doing physical labour by women in their society (Mersha & Van Laerhoven, 2016). In another study, it is reported that gender norms in patriarchal societies inhibit women’s ability to own or access assets, especially productive assets (Quisumbing et al., 2013). Men and women have different access to productive assets, which shapes the types of income activities chosen by men and women (Kristjanson et al., 2014; Neudert et al., 2015; Quisumbing et al., 2013). In a case study in an African country, women dairy smallholders mostly had access to smaller productive assets than men (Quisumbing, 2013). This also led to different capabilities for men and women to access financial support such as formal credits for their farm production (Quisumbing, 2013). This is because collateral is required and, in a patriarchal society, the collateral is held under the men’s names (Quisumbing et al., 2013).

Institutions in relation to gender also influence smallholder farmers’ behaviour. Several studies have shown that social norms related to gender, can result in women being excluded from development initiatives or being denied access to productive assets (Markel et al., 2016; Quisumbing et al., 2013). This normally occurs where women exist in patriarchal societies in developing countries (Markel et al., 2016). In these societies, women are stereotyped as the parties who should undertake domestic roles, while men partake in public roles (Markel et al., 2016). Moreover, men have more power to own productive assets, while women have limited access to such assets (Quisumbing et al., 2013). In a case of livestock, women have lower skills and knowledge on production and

marketing because they have limited access to formal training or education and access to credits to support their farming activities (de Pryck & Termine, 2014). Therefore, scholars strongly suggest that gender norms should be taken into account in rural development initiatives, especially to advocate the equity between men and women in their economic activities (production and marketing) (de Pryck & Termine, 2014; Markel et. al., 2016; Mersha & Van Laerhoven, 2016).

Overall, the studies have identified that institutional aspects play significant roles in shaping smallholders' production and marketing. Several development initiatives have considered the existence of informal institutions, especially for designing the approaches of the development interventions. However, few studies have provided in-depth information about how and why informal institutions impact smallholders' decisions on the management of their farm enterprise. With respect to the specific context of smallholder cattle enterprise in Indonesia, little literature has demonstrated the influence of gender norms in shaping the smallholder production and marketing.

3.5. Summary of the chapter and research framework

The literature reviewed in this chapter includes the studies that answer the question of this research: "What shapes smallholder farmers' management of cattle in NTB Indonesia and why?" These studies comprise those which were conducted in the context of developing countries, rural areas, and rural development. The reviewed literature is not only related to cattle, but also to any other on-farm enterprise that is managed by rural households.

The present study attempts to contribute to the conceptual framework of sustainable livelihoods to understand broader reasons of smallholders' decisions in management of their assets or livelihood activities. Given the context of this research is the rural community in a market mechanism (e.g. smallholder farmers as producers) there are other aspects that must be considered rather than just exploring production and marketing. Rural livelihoods are complex in that the functions of assets and activities are difficult to separate between the purposes of production, consumption, and other functions. In deciding whether to participate or withdraw from markets, scholars argue

that the broader considerations should be explored. Yet, to date, many studies have been more focused on the economic dimension of a commodity. Therefore, the sustainable livelihoods framework is used in this study in order to capture a comprehensive aspect of livelihoods that shape the management of smallholder enterprises (production, marketing, livelihood assets, institutions, and so on)

In the section of theoretical framework, the components and development history of sustainable livelihoods framework are discussed. Scholars and agencies have attempted to develop the sustainable livelihoods framework. The core components of this framework are livelihood context, assets, institutions (transforming structures and processes), strategies, and outcomes. Recently, some scholars developed the components into more detail such as asset functions and attributes.

Empirical literature has enriched the sustainable livelihoods concept. Scholars used the framework in many different ways. The framework was used in order to explore the relationships between components of the framework in shaping particular activities, or people's decisions about livelihoods. There are two main purposes for using this framework, first, to understand the nature of livelihoods in a society, and second, to understand how and why the complex of livelihoods shape smallholders' decisions in production and marketing. In rural livelihoods, much literature explores how different aspects of rural livelihoods shape production and/or marketing of a commodity. However, few studies explore how those aspects interact in shaping rural people's decisions on their commodity of enterprise, which is not only related to production, but also the broader context of livelihoods.

The empirical studies conducted in various developing countries have been reviewed in order to help interpret the findings of this study. The empirical literature in this chapter includes functions and attributes of livelihood assets as well as institutions in shaping management of an enterprise. The studies have explored around the role of relative wealth, functions and attributes of livelihood assets, and the roles of formal and informal institutions in shaping smallholders' production and marketing. However, in terms of cattle enterprise, there is little information about how different livelihood assets with different functions and attributes are interrelated, and shape smallholders'

decisions in managing their enterprise. Moreover, few studies have been explored and reported about the role of informal institutions, including gender norms, in shaping the management of smallholder cattle enterprise, specifically, in the context of Indonesia.

Chapter 4. Research Design

4.1. Introduction

The research question that guides this study is “What shapes smallholder farmers’ management of cattle in NTB Indonesia and why?” This research helps to investigate why and how small farmers in Dompu regency, Nusa Tenggara Barat province Indonesia respond to market-led rural development initiatives in the way they do. The outcomes of the research will inform rural development agencies, especially in Indonesia and, also in developing countries to improve rural development interventions in the future.

This section describes the research approach of my study. It outlines the research paradigm, multiple case studies, site selection of cases and selecting participants, data collection methods, ethical consideration, and qualitative data analysis. The case study research design is then considered more closely with respect to the research design used in this study. Furthermore, I reflect on my journey in applying each step of the research design I have developed since the beginning.

4.2. Research paradigm

This chapter discusses the theory and history of paradigm, and my positionality in this research.

4.2.1. *Paradigm*

In conducting and presenting this research, I use the interpretivist paradigm. An interpretivist believes that “reality is socially constructed, complex, and ever changing” (Glesne, 2016, p. 9). The key here is “to understand” (Thomas, 2013). This type of research explores and make sense of people and the nature of the relationships among them (Thomas, 2013), about the world where they live and activities they undertake (Creswell, 2018). As an interpretivist, I conducted this research in order to explore people’s understandings about the world, especially related to the complexity of rural

livelihoods. I wanted to learn how rural people in this study viewed and lived their livelihoods similarly or differently, and why they were like they were.

For a social researcher like me, understanding the paradigm is important in order to understand why different researchers use different strategies or designs to do research, and why they understand reality or the world in a particular way. Scholars provide several definitions of paradigm. According to Thomas (2013), the paradigm is a framework for thinking and researching the world. Denzin and Lincoln (2018) state that a paradigm comprises researchers' ontology (what we want to know), epistemology (how to explore what we want to know), methodology, and axiology (ethics). In other words, paradigm can be defined as the way researchers think, explore, make sense, and present understanding about the world, the reality, or the truth.

In the past, the term "*paradigm*" was introduced by Thomas Khun, a physics philosopher in 1970 (Thomas, 2013). Thomas Khun stated that paradigm is a framework for thinking about the world, and he realized that the world under study can be perceived in various different ways by different people. This view has been used by social researchers, which leads to the acceptance of various ways of conducting social research and presenting the results. Previously, social research was done in a similar way to the research in natural or technical science in which the social world was measured and studied scientifically (this paradigm was later called *positivism*) (Thomas, 2013). However, it is argued that the reality of how the social world works cannot always be measured, but it also can be understood through how people perceive their own world (this is then called *interpretivism* or *constructivism* (Glesne, 2016; Thomas, 2013). This starting point of using different ways to understand the world is called a *paradigm shift* (Thomas, 2013).

There are several reasons to use this paradigm in this research. I am a social researcher doing qualitative research, and in this study, I did not measure variables, but I am exploring particular cases. This is supported by literature that a researcher under this paradigm does not expect objectivity in viewing the world (Creswell, 2018; Glesne, 2016; Thomas, 2013). Instead, an interpretivist researcher explores and accepts complexity rather than attempting to narrow down the meaning of reality into specific

ideas (Creswell, 2018). My study explores the social world under the research question: “What shapes smallholder farmers’ management of cattle in NTB Indonesia and why?” My aim is to see common patterns or themes from the cases rather than counting situations. Moreover, this research is contextual. This research aims to understand the complexity of the rural livelihoods that shape cattle farming in Dompu Regency Nusa Tenggara Barat Province, rather than generalizing everything, as argued by Creswell (2018). I believe that the results of this research cannot be generalized and applicable to all other cases, yet, this provides some common patterns that might be applicable, similar or even different from other cases. This is supported by some scholars that qualitative research is context-specific that looks at in-depth understandings and involves long-term interactions, with various ways of collecting information (Creswell, 2018). The nature of the results presented is in-depth and descriptive (Creswell, 2018).

I am the instrument of the research because the information I explored relied on my background. In conducting research, interpretivist researchers also do not avoid the reality of involving their backgrounds and personal values in understanding the reality they are researching (Creswell, 2018; Glesne, 2016). I am aware that my cultural background including my origin, culture, knowledge, skills, and experience may influence the reality that I interpret in this study. Therefore, the integrity of a researcher is one of the important aspects that should be kept to make the result reliable.

4.2.2. *Positionality*

I am originally from Lombok Island, Indonesia. My research site was in Dompu, Sumbawa Island, so I am an outsider in the community from where I collected my data. I am a teaching staff member at the Faculty of Agriculture, the University of Mataram. My background of study is in the Rural Systems Management, which focuses on looking at rural livelihoods. I have been involved in several research and development projects (including the research for my Masters study) that used an interpretive perspective in understanding the reality that was studied. In those projects, I collected data in various different ways such as doing interviews, observations, and FGDs. I interpreted the data and constructed my understanding based on the data that has been collected and the supporting theories. I also did similar activities in this research for my PhD thesis,

especially in-depth interviews. I spent several months in the villages I studied and interacted with villagers to help me make sense of situations. I then interpreted the data from the fieldwork, and developed findings and discussion.

4.3. A multiple case study

This is a multiple case study with a preliminary data collection that was conducted using a semi-structured interview, with the support of relevant observations and documents. A case study is a detailed investigation of a person or group over a period of time in order to answer a research question about human phenomena within its real-life context (Merriam & Tisdell, 2015; Stake, 1995). Case study research designs are typically useful in answering the 'how' and 'why' questions that arise in qualitative research (Berg, 1990), and this was intended to be gained through this research related to the complex of rural livelihoods.

This research aims to contribute more broadly to sustainable rural development, especially to market-led rural development initiatives. The literature suggests that a number of factors shape farmers' responses to a particular intervention (Neilson & Shonk, 2014). It is also argued that farmers' responses are shaped by the complex of livelihood assets and strategies (Dorward et. al., 2009), where a particular enterprise is embedded in the complexity as well as shaped by sociocultural norms (Neilson & Shonk, 2014). A multiple case study was used in this research in order to understand how sociocultural norms and other factors influence the nature of a single enterprise within a complexity of livelihood strategies in different groups with different sociocultural backgrounds. I selected a site and chose two sub-cases (two groups in Dompou community), in the case of cattle farming based on the differences of the social backgrounds (the Transmigratory and Local groups). This decision is supported by the literature that a multiple case study involves multiple sites or groups being studied and aims to understand how people from different cases look at a particular issue (Baxter & Jack, 2008). Through this design, I identified the patterns of similarities and differences between the two cases, and how those sociocultural differences shape each of the whole livelihood portfolios as suggested by Baxter and Jack (2008). Merriam (1998) further

states that a multiple-case study provides the potential for greater explanatory power than a single-case study.

Multiple data-gathering methods were employed in this study. The main method was the semi-structured interview, and was supported by documents and observations as suggested by Creswell (2018). However, the way the documents and observations were used in this study was slightly different. The documents supported the case description and context of the research, and observation was used to support the development of the questions during the semi-structured interviews. This case study was then reported in a rich, detailed case description and discussion of emerging patterns as recommended by Creswell (2018).

4.4. Site selection

This study was conducted in Dompu Regency, Nusa Tenggara Barat Province because of several considerations that were relevant to the research question and the nature of the research. Dompu was a targeted region of rural development initiatives, especially related to cattle farming development. It provided examples of different farming systems of cattle from different farmers' background, and was logistically practical in terms of data collection sites.

Dompu was one of the targeted areas of the cattle development programmes by the provincial governments, such as the BSSP (Beef Self-Sufficient Programme) and the BSS (the "a million cattle programme") (NTB provincial government, 2009, 2014). This area was also a targeted area of several rural development initiatives, for example, by the collaborative project of the agricultural development programme between Massey University and the University of Mataram (Anderson et. al., 2014). In addition, as NTB province is one of the biggest national suppliers of cattle at the national level, Dompu was one of the main production areas in NTB province (Ministry of Agriculture of the Republic of Indonesia, 2017; Statistics Nusa Tenggara Barat province, 2012).

The scoping study to select the sites was conducted three months prior to the commencement of fieldwork. I went to Dompu and met some key informants to help me select the sites. During this stage, I already had an understanding from the literature

(as explained earlier in this chapter) that rural development interventions toward a specific enterprise cannot be separated from the complexity of the whole livelihood system. There are interactions between assets and strategies and the influence of sociocultural norms (Dorward et. al., 2009; Neilson & Shonk, 2014). From the scoping study, I identified that there was evidence of different patterns of cattle farming management between two communities with different social backgrounds (the Transmigratory and Local groups) in Dompou. Both cases will be described later in the chapter 5. The differences of cattle farming management which were identified were enforced by different sociocultural norms. From this study, the sites were then chosen based on the village to scope the two social groups, because the ways those cultural groups lived, operated, and coordinated were through the village system. The village system was chosen as “a bounded system” in this case study as recommended by Merriam and Tisdell (2015). In addition, case study research is done where there is commonality, and uniqueness can be seen among a group or groups of people or in a system or system (Stake, 1995). There were two “bounded systems” in this study, and each represented the Transmigratory and the Local communities; each of them then became the “case” of this research.

In addition to the reasons explained above regarding site selection, there were some other reasons for choosing the two sites, such as physical and natural homogeneity of the sites as well as the practical reasons suggested by Thomas (2009). Two sites of this research were chosen because both are in Dompou area and thus have similar physical and natural characteristics (types of soils, climate, seasons, types of plants available, and crop farming system). This research intended to explore human and social aspects of livelihoods. Therefore, the sites that were chosen were expected to reduce possible variability of factors which were shaping cattle farming in this study. There was also convenience reason in choosing these sites. This aimed to ensure the process during interviews was manageable, especially to deal with long interviews with many participants (63 interviews with 1-2 hours' length of each interview), time, and cost. The two sites were reachable from the base where I stayed during the fieldwork in the administrative centre of Dompou. The village of the Local group (Simpasai vllage) was within the administrative centre of Dompou, while the Transmigratory group (Kampasi

Meci village) was located thirty minutes' travel by motorcycle from the city. Therefore, these sites met the considerations explained above.

4.5. Selecting participants

Sixty-five people in this study were interviewed during the fieldwork from November 2016 to February 2017. They were key informants (Table A), and people from the Transmigratory and from the Local cases (Table B).

4.5.1. Key Informants

There were twenty key informants in total, who were from various roles that were considered relevant to both groups, as well as each group. The key informants were chosen based on their roles in their institutions (for the government staff) and in their community (formal and informal group leaders) in each of the cases. I assumed that they had knowledge and were involved in the implementation of the market-led rural development initiatives for cattle. Therefore, I expected the information from them that was relevant to the research question "What shapes smallholder farmers' management of cattle in NTB Indonesia and why?" They were from the government offices from provincial level to village level, formal and informal group leaders in each of the cases, and actors in cattle supply chain in both cases.

Table 4. 1 List of key informants (The names are pseudonymous)

No	Name	Institution/location	Roles
1	A farmer group interview in the Transmigratory case	Farmer group/Transmigratory village	An informal group of farmers
2	A farmer group interview in the Local case	Farmer group/Local village	An informal group of farmers
3	Mr Maklum Amin	Regional development planning, Dompu	Head of programme
4	Mr Akramul Karim	Regional development planning, Dompu	Head of monitoring and evaluation

5	Mr Jayengrana	A traditional leader of the Transmigratory group	A corn farmer group leader
6	Mr Lapang Harjo	Government field officer of crop farming	Working with crop farmers in the Transmigratory group village
7	Mrs Rahmah Husna	Head of village of the Local group	Doing governmental and administrative roles
8	Mr Sukma Arga	Head of Village of the Transmigratory group	Doing governmental and administrative roles
9	Mr Sholeh Adli	Head of Livestock of Woja Sub-District	Managing livestock development programmes where the Local farmers are a part of the area of supervision of this office
10	Ms Miftahul	Government field officer of crop farming	Working with crop farmers in the Local group village
11	Mr Rukmana	Head of Livestock of Manggelewa (the Transmigratory case)	Managing livestock development programmes where the Transmigratory farmers are a part of the area of the supervision of this office
12	Mr Rangga Rangkuti	A livestock farmer group leader in the Transmigratory case	One of the informal leaders in the village
13	Mr Indra Lesmana	Department of Transmigration NTB Province	Assigned for transmigration initiatives
14	Mr Putra Jaya	Head of grazing land office, Doro Ncanga, Dompus	Managing programmes and services in the main grazing area
15	Mr Hamdian Wardi	Extension office of Dompus	Head of Extension Department
16	Mr Wakil Syaih	Livestock office of Dompus	Head of livestock entrepreneurial programme
17	Mr Zuhri	Agricultural Department of Dompus regency	Head of programme
18	Mr Andy	MHH, a formal livestock farmer group in the Local village	Group leader

19	Mr Tarumanegara	Cattle market actor, the Local case	Butcher
20	Mr Hajarwadi	Cattle market actor, the Local case	cattle buyer
Total number of key informants		20	

The process of identifying the key informants was snowballing, as the evaluation of the previous interviews led to the needs for meeting particular people in the next interviews as suggested by Noy (2008). I also determined the participants purposively based on the criteria I set for the key informants (See Appendix A, the Fieldwork Manual).

At the beginning, the criteria of the key informants I set in this study were based on the context of market-led rural development initiatives for cattle, and rural livelihoods. I chose those who were knowledgeable about the people in terms of the common livelihoods, cattle farming, cattle development interventions, or others that were related to my research questions. I identified some of the key informants, for example, the staff of the Regional Development Planning of Dompu, and the staff of the Livestock Department of Dompu. From the community sides, I decided to meet some representatives of each village such as a farmer group, head of the village, and an informal group leader because they met the criteria related to the research question. I chose them based on the background of my research about market-led rural development initiatives, especially related to cattle farming. I assumed that the people from these institutions would be the most suitable to meet because they had knowledge about the implementation of cattle development programme from the government. However, I found that there was further information needed, for example, the Transmigration programme, the common grazing land, and crop farming. Therefore, I identified the other key informants that were able to provide information around the material I needed.

4.5.2. Participants from the Transmigratory and the Local cases

There were a total of 19 and 25 interviewees from the Transmigratory and the Local sites respectively. The criteria of participants used in this research were based on the livelihood portfolios (the sustainable livelihood framework) instead of the size of the herds in the households (Bulu, Muzani, & Puspadi, 2003). The literature informed that a smallholder farmer household in NTB has a maximum of two cattle because of their limited labour capacity within the household. Hence, at the beginning of the interviews, the interviewees were grouped into two, which included those who owned and raise zero to two cattle, and those who owned and raised more than two cattle as suggested by Bulu et.al. (2003). However, I found that the farming activities and the number of cattle farming did not give major differences in cattle farm management. I found that there were some varieties of strategies run by different households to sustain their livelihoods. These varieties were related to livelihood portfolios instead of the size of cattle herds only. Those varieties included the differences between women-headed households and men-headed households, crop farming activities, increasing and reducing the size of herds, non-cattle related activities, *kadas* (shared farming) and so on. Therefore, a rich and in-depth understanding regarding what shapes smallholder farmers' decisions on cattle farming could be gained.

At first I planned the participants I would interview. They were smallholder farmers and some of their family members (e.g. MHH with his spouse and WHH). However, in reality I interviewed the husband and wife of some MHH. For others, they were the husband or the wife only. This was because I could not meet each of their spouses. Some of them were not willing to be interviewed and others were busy on their farm. I also found that some MHH did not have a wife because of divorce or passing away.

During the fieldwork, I chose interviewees based on the information from my field assistants, the previous participants, and some Local people in the villages. I explained to these people the criteria for selection of the people I wanted based on the manual (Appendix A) and I cross-checked among them. Once I established the most suitable people for interviewing, I met them and asked about their willingness to participate in the interview.

Table 4. 2 List of participants of the Transmigratory and Local groups (the names are pseudonyms)

No	Transmigratory group			Local group		
	Name	Roles/status/main job	Number of cattle managed	Name	Roles/status/main job	Number of cattle managed
1	Mr Arjuna Wahid (Ms Indah's father)	Single MHH that shared living and cattle farming with his divorced daughter.	2	Mr Syaiful Yusuf	MHH, cattle owner, <i>kadas</i> , corn farmer	16
2	Ms Indah (Mr Arjuna Wahid's daughter)	WHH shared living with her single father		Mr Jamal	MHH	4
3	Mr Afandi	MHH shared living with her widow mom	1 (used to have many cattle)	Mr Ammanulloh	MHH, motorcycle taxi rider	more than 10
4	Mr Abdul Faisal	MHH cattle buyer (middleman)	Many	Mrs Ammanulloh (Mr Ammanulloh's wife)	A housewife of an MHH	
5	Mrs Jayengrana	A housewife of an MHH, a business woman	4	Mr Niyatul Iلمي	MHH, corn farmer	2

6	Mr Fathul Rokhman	MHH	1 own + 3 <i>kadas</i> , brick maker	Mrs Mawarni	WHH, rice farmer	Used to be a cattle owner for <i>kadas</i>
7	Mrs Ayana Rokhman (the wife of Mr Fathul Rokhman)	A housewife of an MHH that also participated in the interview		Mrs Siddiq (Mr Siddiq's wife)	A housewife of an MHH who participated in this research too MHH, crop farmer	3
8	Mr Darwan	MHH	3	Mr Siddiq	MHH	
9	Mr Andalusia	MHH	0 (sold all of the cattle)	Mr Mahsyur	MHH (sharing house and living with his mother)	3
10	Mrs Vitri Fatima	WHH	1	Mr Muda Karna	A single young man living with his parents	4
11	Mrs Dita Pujiani	WHH (husband in Malaysia)	1 own + 1 <i>kadas</i>	Mr Mahdali	MHH	8
12	Mr Untung Surapati	MHH	1 own + 4 <i>ka das</i>	Mrs Mahdali (Mr Mahdali's wife)	A housewife of an MHH	
13	Mr Aufar	MHH single	0 (Bakso or meatball seller)	Mrs Daliman	A housewife of an MHH	4
14	Mrs Setyo Haning	A housewife of an MHH	1 own + 3 <i>kadas</i>	Mrs Sabaruddin (Mr Sabaruddin's wife)	A housewife of an MHH, bamboo screen maker	1
15	Mr Indra	MHH who runs cattle	Many	Mr Sabaruddin	MHH, bamboo	

		business (fattening, selling)		n	screen maker	
16	Mrs Dian ansari	A housewife of MHH	0 (used to have cattle)	Mr Zakki	MHH,	14
17	Mrs Maya Sukma	WHH	3 own+3 <i>kadas</i>	Mrs Tania Salma, Mr Zakki's wife	A housewife of an MHH, a food seller	
18	Mr Gunawan	MHH	Many	Mrs Dahniar Rena	WHH, a business woman	2
19	Mrs Ginara	MHH, a housewife + veggie vendor	0 (the husband looked after parent's cattle without payment)	Mrs Andita Setya (shared house with her son and family)	WHH, a brick maker, a farm labourer	0
20				Mr Galang	MHH, corn farmer	3
21				Mr Ahmad Rahmim	MHH, brick maker, crop farmer	
22				Mr Rudiantama ja	MHH, a businessman	3
23				Mrs Kelana rahmi	MHH, acting as MHH since the husband was sick, rice farmer, a woman activist	0
24				Mrs Darulita	WHH, creditor	0
25				Mr Setya	MHH, teacher	8
	Total interviewees	19		Total interviewees	25	

Interestingly, in Kampasi Meci, it was easier to find a divorced WHH than in Simpasai. In Simpasai, the women I interviewed were widows rather than divorcees. Hence, I found many of the WHHs were young (in their 20s to 40s) in Kampasi Meci, while the WHHs were over 40 in Simpasai. One of the WHHs in Simpasai was in her 80s and still looking after her farm and cattle with her son.

I used the criteria of the participants I prepared in the fieldwork manual (Appendix A) to choose who I would like to interview, but who I chose to meet was also based on the previous interviewees' information. For example, in my previous interviews, I found that the role of personal creditors (a *rentenir* or informal creditor, and crop input creditors) was very important. The availability of creditors could be an alternative allowing the farmers to start their crop planting without selling their cattle or when they do not have any other source of saving. My assistants helped me find a creditor. We found one in Simpasai, but I could not find one in Kampasi Meci because, in this case, credit was not in the form of money but of input supplies. I then interviewed some participants who were not only the farmers' family but were also input suppliers in Kampasi Meci. Some of the input suppliers had other kinds of income activities as well.

4.6. Data collection methods

This study employs the semi-structured interview with the support of observation and document. Participants such as farmers and key informants were interviewed, observation was used to support the development of the questions during the semi-structured interviews, and documents were used to support the case description and context of the research. Before conducting the data collection, I prepared a *fieldwork manual* to guide me during the fieldwork (Appendix A). The manual included the research design and detailed a step-by-step procedure to conduct data collection during my fieldwork that was able to help me stay on track and manage my fieldwork efficiently. However, there were some changes or modifications made to adapt to day-to-day conditions emerging during the field work. In addition to the manual, I prepared some necessary documents such as an information sheet and consent form for participants, assistants, and transcribers or research assistants (Appendix B). These documents are explained in the ethical considerations' section.

4.6.1. *Semi-structured interviews and selecting participants*

Of the three types of interviews: structured interviews, semi-structured interviews, and unstructured interviews, this study employed semi-structured interviews. The semi-structured interview was chosen because it allows the researcher to control the direction of the interview, to have the flexibility to change the order of the interview questions, and to have more chance to acquire extensive follow-up responses (McDonough & McDonough, 2014). By using a semi-structured interview in this study, more in-depth information, therefore, can be gained than by using a structured interview as recommended by Berg (2009). In addition, the interactive nature of in-depth semi-structured interviews has many advantages over other types of data collection strategies (Best & Kahn, 1998). The scholars further indicate that interviews can obtain unique information held by the person interviewed (Best & Kahn, 1998). Interviews can also provide insights of the situation which researchers are unable to observe themselves (Stake, 1995). During the fieldwork of this study, 63 interviews in total were completed (Table 4.1 and Table 4.2.). The average length of the interviews was 60 minutes with a range of 120 minutes (1-2 hours).

I employed two research assistants who had knowledge of the area and also could speak the Local language. I hired them in order to identify the participants, and also because I did not speak the Local language in one of the cases (the Local Dompou language) and was not familiar with the area. They were also provided with a confidentiality and anonymity consent form.

Before conducting the interviews, I did some preparation, including coordination with field assistants and building rapport between people in the sites, especially the participants and myself as a researcher. This process is important as it is advised in the literature that building rapport and managing bias are also important aspects of ensuring the credibility of the research (Creswell, 2018). I received information from the key informants in this research that people in the villages often thought that new people who looked like they were from development agencies would give them assistance (they called it "*bantuan*"). People in this region perceived *bantuan* as receiving some things for free, such as cattle or input supply grants as a part of a

development intervention. For me, this is a potential *bias* for my data because, at the scoping study, I also had an experience of what the key informants told me about the people's view of a new person from a development agency. The person asked whether I brought *bantuan* and he started to tell me that his life was very poor without having any source of income activities and lacked assets while, in fact, he had a land to grow crops and he had just come back from rearing his cattle that were tethered at the front of his house. The type of "bias" in an interpretivist study means treating stories in a fair and balanced manner (Denzin & Lincoln, 2018). It is also argued that a case study should be conducted in its natural setting based on the contemporary context (Merriam & Tisdell, 2015). Therefore, in order to avoid unnatural information from the participants, prior to each interview, I introduced myself and the purposes for doing the interview as part of my PhD research. I also highlighted that I was an independent researcher who was not part of a particular development programme. Hence, I explained to them that I did not bring any stuff or *bantuan* to them at the moment of the interview, nor after that.

One of the benefits of introducing me as an independent researcher and also explaining the nature of my research to every participant at the beginning of the interview was to make farmers well-informed and provide natural information about their livelihoods. As suggested by the literature, information from interviews provides essential evidence because well-informed interviewees can provide important insights into the process under study (Thomas, 2013).

With permission from the participants (after given the information sheet and consent forms), each interviews was recorded. In addition to the tape recording, note-taking was undertaken during the interviews to record key points which were considered important in this research. After each of the interviews, I made a summary of the information obtained based on my memory to help me recall the information later when I analysed the data.

In the interview, I used a list of questions which I developed every day, based on the participants I interviewed and the types of information I needed. The types of questions between farmers and key informants were different (Appendix A). The information that was gathered from farmers was related to livelihood assets, institutions, activities, and

outcomes. The key informants were asked different kinds of information/questions. For cattle buyers and/or exporters, they were asked about the market system, set pricing, bargaining strategy, and strategy to fulfil market cattle demand. I also asked them about their strategies to maintain relationships with farmers, how they supplied cattle to broader markets, and other topics related to cattle marketing.

I evaluated my interview activities. I wrote a journal in order to reflect on my experiences during the data collection. This was not only to explore the information but also aimed to improve the techniques and quality of the interviews through identifying issues. According to Thomas (2009), there may be lessons learnt from the data collection process which can be used within case sampling to improve later interviews. The journal allowed me to highlight the good things and the constraints faced during the interviews, and why those happened. I discussed some necessary conditions I found with my research assistants in order to make sense of why I faced particular conditions. Moreover, I would recheck with my assistants about appropriateness to say or do some things to participants in terms of social norms. Therefore, I could improve the process during the interviews from these lessons learnt.

What I highlighted from the interviews was that by telling them I was someone who wanted to learn from them (the participants) this could avoid the interviewees feeling interrogated or researched. This strategy enabled me to anticipate a more natural atmosphere of a conversation between the participant and me, as a researcher who also involved my research assistants as my interpreters. Ideally, I started with introducing myself and my study and also asking about their background. However, it did not proceed as I expected. Our conversation jumped over to some different topics. For example, when I introduced myself and my research, the participants talked directly about their work and some other things around farming activities before I had a chance to ask their background. Yet, I just followed the flow of the conversation while understanding the participants' characteristics whether they were quiet, shy, talkative, or assertive types of people. Later on, I provided a time slot to ask them their background while kept observing their personalities and understood how to approach him or her to make them talk more comfortably. An example is when I talked to the Head of Programmes and Reporting of the Department of Livestock, Dompou. I asked his

background after six minutes of our talking together. I found that asking personal background such as family, origins, work, or study could make the atmosphere more casual and intimate. I also made some jokes, or I responded to their jokes, after I sensed their personalities.

The reason for not being too rigid with the structure of the interviews was to keep the atmosphere relaxed so that the flow of questions was kept on the track. I tried to not allow the topics to get out of control, however, if I found the participants' information was relevant and important, I just allowed them to talk even though that meant the topics changed to other directions. I would then bring the topic back to the earlier stage which had not been finished. Although it would appear that the topics jumped around, I actually found that the talk went smoothly. I could gain richer information and understanding of and insight into the participants' livelihoods in which cattle were involved in the discussions.

There was an experience in dealing with some sensitive issues which often made participants hesitant to share information. Once I had acknowledged that our topic was sensitive, I offered several choices to participants, for example, I offered to turn the recorder off, or asked them whether they would like to continue their talk or not. I also learnt about my response when they talked about it from dealing with sensitive topics. I showed the participants that what they told me was something natural and was not unusual at all for me. Instead, I showed them that their story was very interesting. For example, a divorcee told me about her problems when she and her partner were divorced. I showed an empathic expression but I did not express my own feeling into words. This strategy proved to be comfortable for the participant and enabled her to speak fluently. Another example was when we discussed gender roles in their households or at the community level. I often recognised that the atmosphere of the conversation turned awkward when we talked about gender roles. However, I showed my enthusiasm and seriousness in listening to their explanation. I did not ask the participants directly by using the words that refer to "gender roles", but I preferred to ask them some indirect questions that symbolised gender roles. For example, I asked them "...Then who did talk to corn buyers after harvesting? Did your wife do that or you?" and later I asked the reasons while the participants gave details, instead of asking

“how do your wife and you divide your roles in corn farming?” or “Why do you do land ploughing and your wife only cooks food instead of helping you on farm?” However, there was no standard way of asking questions because those were contextual, depended on the topics, appropriateness of topics, treatments and responses, and so on. This really depended on the personal skills of researchers in conducting interviews.

While I was conducting interviews, I faced several other issues and there were some strategies I undertook to deal with these. The first issue was when I dealt with an unexpected incident related to flooding in Bima, the neighbour regency of Dompu. I arrived in Dompu on Thursday, 22 December 2016 early in the morning. I came at a slightly unfortunate time because it was a day after a flash flood in almost all of the areas in Bima, including in the capital city, and which led to all of the activities in the regency being shut down. People needed food, clean water, clothes, places to live and medicine. So many people, especially from Dompu, went to Bima to help the victims, particularly families and relatives who lived in the impacted areas. My research assistants, most participants and key people of my research could not meet me at the time arranged. I therefore re-arranged my plans and met at times that suited the interviewees. For example, some of them wanted to meet at night, at around 8 pm and the interviews finished from 10.30 to 11.00 pm. Sometimes, I was alerted with sudden calls from the participants, saying they were able to meet me soon.

The second issue regarded the seasons in relation to managing time to interview farmers. As I came during the crop growing season, it was a bit challenging to meet farmers because they were busy on farms. Some participants worked on their own farms, while others were the farm workers. However, I wanted the interviews to be relaxed and free from pressure to ensure I would get natural stories from the participants. I also did not want to disturb them when they were too busy or to make them rush in doing their work because of our appointment. Therefore, I decided to stay in the field for longer to allow more flexible timing for them so that whenever they had time to meet me, I could come and do the interview.

People were available at their house and did not travel for holidays, and they were willing to meet me, even during the New Year. Therefore, I continued the data collection activity until the 29 December 2016.

4.6.2. Collecting documents

As explained previously in this chapter, documents were used to support research background, context of the research, and case description. These provide more detailed contextualised information (Petty, Thomson, and Stew, 2012b). There were relevant documents to this research, which were accessed from offices, and relevant and reliable websites such as some Ministries of the Indonesian Government (the Agricultural Ministry, Financial Ministry, Kementerian PPN/Bappenas⁵, and so on) and other organizations. Government documents included village profiles, profiles and reports of Government programme interventions, extension agency reports, statistical data), and profiles and reports of programmes run by NGOs or international projects. These two types of documents helped support the data obtained from semi-structured interviews. In order to get access to the data needed, letters from Massey University and the University of Mataram office were sent to the relevant government offices. Once they were approved, I visited their offices to access the data needed. Fortunately, all of the offices were willing to provide me with documents I needed as far as I told them and provided them with the supporting letter.

4.7. Ethical considerations

Before conducting fieldwork in this research, I applied online to the Massey University Human Ethics Committee (MUHEC) for human research ethics approval. Ethics aim to protect interviewees and researchers from harm (Ritchie & Lewis, 2003; Ritchie, Lewis, McNaughton Nicholls, & Ormston, 2014). In a qualitative research, it is important to respect the interviewees in terms of privacy, and protecting them by taking account of existing vulnerability, as well as implementing reciprocity with them (Glesne, 2016). Therefore, prior to conducting interviews, the ethics were discussed with my

⁵ Kementerian PPN/Bappenas is the abbreviation of *Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional* or the Ministry of National Development Planning/National Development Planning Agency

supervisors to seek aspects of considerations that needed to be taken into account in order to ensure the privacy and rights of the participants, for example, the freedom to participate or not in the interviews, to be recorded or not, and so on, which were listed in the consent form (Appendix B). An information sheet (Appendix B) was given to the participants before each interview, explaining my research plan and asking for volunteers for my study. The information sheet also informed the participants of the objectives and benefits of the research, of their assurance of confidentiality, and of data management procedures. A consent form was provided for the people who agreed to participate in the interview.

4.8. Data analysis: Qualitative data analysis

Data analysis in qualitative research involves the process of “systematically searching and arranging interview transcripts, field notes and other materials” (Bogdan & Biklen, 1992, p. 147) which enable researchers to analyse the findings. In this study, the qualitative data from semi-structured interviews were analysed to identify significant themes. Note-taking during the data collection and analysis was used to help develop the questions to make sense of some information during the analysis.

Before analysing the cases, a case description is provided. It is then followed by within-case analysis. As this study uses two cases, the analysis also involved cross-case analysis and the comparison between the findings and the literature.

4.8.1. Case description

Case description refers to a description of the case or the “facts” about the case in a study, which are recorded by the researchers (Creswell, 2018). A case description can be a history or a chronology of an event (Stake, 1995). A case study presents unique facts about a case so that a case description is an important requirement in helping to understand the findings which emerge from that case (Creswell, 2018). In this thesis, the case description is provided in Chapter 5. The sources of the case description were the information from the key informants and from relevant documents or secondary data.

4.8.2. *Within-case analysis*

Each case was analysed by using the qualitative data analysis method. The process of within-case analysis comprises transcribing audio recordings of interviews, interpreting data, identifying themes emerged from the data, and writing up the findings of each case.

a. Transcribing

All of the interviews recorded digitally were the transcribed. Transcription was an initial process of the analysis of this data. Some interviews were transcribed by me (the first 15 interviews), and the rest were by professional transcribers after signing a confidentiality consent form. A holistic sense of the data was gained through intensive interaction between me and the transcription through the processes of transcribing and summarising of each transcription.

b. Interpreting data

The next step of the data analysis, after the transcribing stage, was interpreting the data. All of the transcriptions were read and re-read, while questions kept emerging constantly during reading them through. Note-taking was also made during the analysis to highlight important points and to improve understanding of the transcription. Moreover, the process of understanding was supported by relevant documents and transcriptions of the interviews with some key informants. Even when the Findings chapter was written, I came back to the transcriptions and documents to recheck them. Some necessary information that needed to be added to the findings was also taken from the transcriptions and documents. The important points were highlighted and then interpreted. Every new point gained from reading the transcriptions was written and highlighted. This was driven by constant questions which emerged during reading the transcriptions.

c. Identifying themes and writing the findings

This research is data-driven or inductive research. Inductive research generates a general principle from experience (Thomas, 2009, 2013). The data was analysed based

on the perspective of the Sustainable Livelihoods framework (DFID UK, 1999). However, in the inductive analysis, the data does not have to match exactly with the framework used in the research. The most important is that the emerging themes were the key findings which answered the research question.

The key findings emerged after reading and re-reading the transcription, the notes made in the transcripts, referring to the field notes and relevant documents, and comparison with the theories being used in the Literature Review chapter. I call the process of analysis in this research as a constant “synchronization” process between all chapters in this thesis. This aims to ensure the interpretations that were made matched with the interviewee's words as well as the supporting documents. I spent much of my time in this process until I was sure that my research question was answered until the final draft of my thesis was completed. This was also done through using direct quotes from the interviewees extensively in the findings and the crosscase analysis chapters. The synchronization process included thinking, analysing, reading, and discussing with supervisors and fellow PhD candidates who had the same interests as me, and writing up the findings.

4.8.3. *Cross-case analysis*

Cross-case analysis is used in this study. The themes in the two cases (the Transmigratory and the Local) were compared and contrasted in the cross-case analysis chapter (Chapter 6) after identifying the themes in each case. Cross-case analysis enables comparison of two or more cases in a study by looking at similarities and differences when the units of analysis are the cases of the study (Khan & VanWynsberghe, 2008). Cross-case analysis also provides thematic analysis across cases (Creswell, 2018). Miles and Huberman (1994, p. 205) suggest that “a researcher should look carefully at the complex configuration of processes within each case and understand the local dynamics, before one can begin to see patterning of themes that transcends particular cases.” The variations (similarities, contradictions, or new insight) emerged across the cases and provided evidence about the dynamics which could emerge and that have contributed to the development of the existing theory.

4.8.4. Comparison to the literature

The next step before writing up the conclusion is comparing the findings and the cross-case analysis with the literature. This is part of the discussion (Chapter 8). Comparing the research findings with the literature aims to enrich the existing theories. By the comparison, the current findings may support or contradict the existing theories. However, the findings might enrich the theories from new and different perspectives.

4.9. Summary of the chapter

This qualitative research has been conducted under the *constructivism* paradigm and with a case study approach. The main data source for this study was from interviews with the support of field observations to help develop questions. Documents were used to support research background, research context, and case description. This enabled me to gain an in-depth, detailed understanding of the situation under study. In my case, this process helped me to understand the research question: “What shapes smallholder farmers’ management of cattle in NTB Indonesia and why?”

The sources of data comprise interviews and document analysis. The interviews involved various sources including smallholder farmers (men-headed households and women-headed households), cattle and non-cattle farmers, cattle and meat market actors, and some relevant government officers. In-depth interviews were done with the help of some research assistants to guide me during data collection. The interviews were recorded. Participation in the interviews was voluntary and participants were provided with information and consent forms before they agreed to participate in the study. The consent forms aimed to keep the ethics of the research and to protect the rights of the participants. Documents were collected from government and non-government sources in forms of soft copy, hard copy, and online.

Data analysis was done qualitatively, involving transcribing interviews, note-taking, interpreting, and identifying the themes in each case. However, the research is an inductive or data-driven process, where the findings depend on the data rather than being based on existing theory. A sustainable livelihood framework and the related literature were used during data analysis to help understand the data from an academic

perspective and to look at potential themes emerging from the data. After the within-case was analysed, cross-case analysis was also carried out. The analysis involved comparing and contrasting the findings of each case. It was then followed by comparing and contrasting the results with the literature.

Basically, the process of analysis also involves writing the thesis itself. This includes the “synchronization” process between chapters which develops a comprehensive understanding about this study.

Finally, from the process of this research, I learnt a very important lesson. Qualitative research is a dynamic and unique process, which involves interdependence between all stages of the process of the research, and between the research and the researcher. The sound understanding I gained of the context of the study contributed to the type of presentation I selected for the thesis.

Chapter 5: Case Description

5.1. Introduction

Chapter 5 describes the characteristics of the province and district where the study was conducted. The cases were located in the Nusa Tenggara Barat province, in Dompu Regency on Sumbawa Island. The cases were part of the regency, but in different sub-districts. Hence, this chapter describes the physical and socioeconomic characteristics of Dompu Regency. Moreover, this chapter also includes development initiatives for cattle production and formal and informal financial institutions in Dompu. The physical and socioeconomic characteristics of each village, where the cases were located, are also described. Lastly, the characteristics of both cases are then compared and contrasted, followed by a summary of the chapter.

5.2. Physical, social, economic characteristics of Nusa Tenggara Barat Province

This section provides the information of physical and socioeconomic characteristics of Nusa Tenggara Barat Province, Indonesia, where the two cases are located. In addition, the flagship programme of development initiative in this province is included, as well as the nature of the farmer groups of crop and livestock.

5.2.1. Physical characteristics of Nusa Tenggara Barat Province

Nusa Tenggara Barat (NTB) is located in the eastern part of Indonesia, which lies between Bali and Nusa Tenggara Timur provinces. It comprises hundreds of islands, with Lombok and Sumbawa being the two largest islands of this province. The area of NTB and Sumbawa Island are around 20,153.15 km² and 15,414.5 km² respectively. Sumbawa Island is 76.49%, or 3/4 of the total area of NTB. Lombok Island is smaller than Sumbawa Island, however, the capital city of the province, and most of NTB population, is in Lombok Island. The two cases of this research are part of Sumbawa Island.

The climate of NTB is tropical, as in other areas in Indonesia, and has dry and wet seasons. On average, the rainy season is between September and February, and the dry season is between March and August.

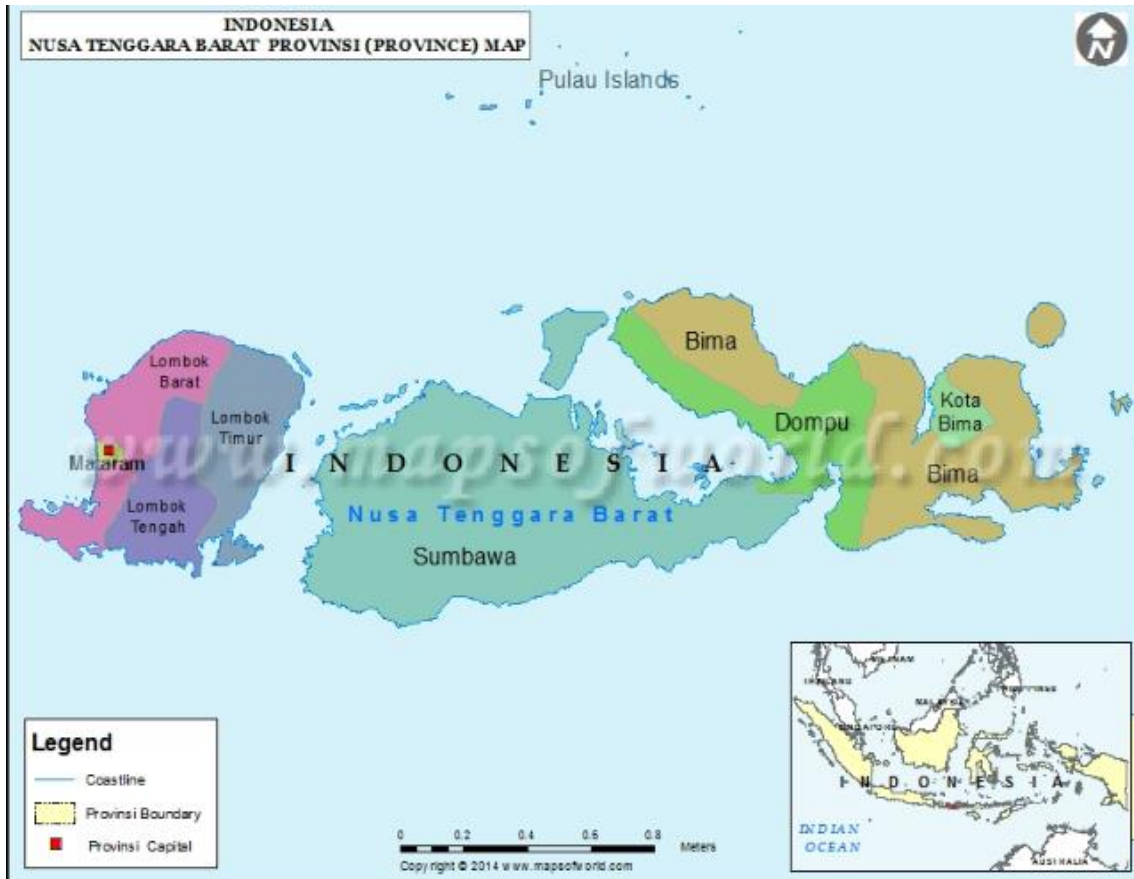


Figure 5. 1 Map of Nusa Tenggara Barat province. Source: Maps of World⁶

5.2.2. Socioeconomic characteristics of Nusa Tenggara Barat Province

The main agricultural commodities of NTB province are rice and corn. In 2015, the rice production was 2,116,637 tons and corn was 959,973 tons (Statistics, 2017). Other commodities produced in this province include soybean, peanut, cassava, and vegetables.

⁶ Maps of World <https://www.mapsofworld.com/indonesia/provinces/nusa-tenggara-barat.html>.

5.2.3. *The cattle-corn-seaweed development programme (PIJAR) and the 'a million cattle land' (BSS) NTB programmes*

There is both wet and dryland in NTB and some land used an irrigation system. In 2016, the area of wetland was 266,478 hectares (ha), which is the area to produce rice. The irrigated system was 210,933 ha, and the non-irrigated system was 55,545 ha. The harvested area for rice was 412,897 ha with an average productivity of 5,353 kgs/ha and. The total production of rice was 2,210,207 tons. On the dryland which corn or bean crops are grown, the harvested area was 54,606 ha with the average productivity being 3,794 kgs/ha. The total production of rice was 207,185 tons. The harvested area of corn 143,117 ha had an average productivity of 6,708 kgs/ha, and the total production was 959,973 tons (Statistics, 2017).

For livestock, NTB province produced cattle, buffaloes, horses, goats, chickens, and ducks. In 2016, the population was 1,095,719 for cattle, 125,122 for buffaloes, 60,540 for horses, and 643,079 for goats. The livestock was exported to other areas in NTB (e.g. Lombok Island), and other provinces such as Java, East Kalimantan, and Papua (Statistics, 2017).

5.2.4. *Farmer groups: crop farmer groups versus livestock farmer groups*

The Cattle-Corn-Seaweed development programme, or Program Sapi Jagung Rumput Laut (PIJAR), a flagship programme of the Provincial Government of NTB, was initiated in the provincial development planning 2009-2013. The main aim of the PIJAR is to increase farmers' farm production and improve well-being.

Agriculture and marine became the focus of development in order to optimise local resource use in NTB. Agriculture is the sector that absorbs the most labour. Moreover, the development of these three commodities (cattle, corn, and seaweed) is chosen as the flagship programme because it is supported by the local resources which are available in this area. Those are human, natural, and infrastructure resources, as well as formal and informal institutions.

NTB Government believes that this area can compete with other provinces to be one of the cattle suppliers at the national level. This province was one of the eight largest suppliers to fulfil the national demand of cattle in 2009. By focusing on cattle production, the Government expected that the future development programmes would be able to help cattle farmers increase production, participate in markets and increase income.

The 'a Million Cattle Land' or Bumi Sejuta Sapi (BSS) is a programme that was initiated by the NTB Provincial Government to follow up the PIJAR Programme. The aim was to accelerate cattle production in this area. The local government coordinated with the Government at all levels, from national to the grassroots level (the village level) to achieve the goals.

Basically, gaining a million cattle population within five years was the jargon to motivate all possible stakeholders to support the BSS programme. In reality, the programme focused on developing the local breeds such as Bali cattle, however, the imported breeds also received attention. The cattle population in NTB in 2009 was 587,247. Without the BSS programme, it was projected that the population would reach 785,346 in 2013. However, with the support of the programme, it was expected that the population would be around 1.032.507 in 2013.

The focus of the BSS programme was to increase production. The activities targeted were to achieve 38-42% increased production, to increase live calves for 75-85%, and to reduce the calf death by 10-18% within five years. The other targets were to reduce the slaughtering of cows by 8-15% and the export of calves to outside of NTB.

There were several characteristics of NTB that made NTB province able to compete at the national level. First, the ratio between cattle beasts and people in NTB is higher than the ratio at the national level, being 1:6 and 1:17 respectively. Second, the percentage of calving was above the national level (66% in NTB compared to 40.72% national). Moreover, NTB had a surplus meat supply compared to the local demand, while the national demand was still in deficit. Third, many local farmers in NTB were still holding some types of social capital and informal institutions, for example, keeping cattle in a group of farmers, which were hardly found in other areas in Indonesia. Lastly, the area

of NTB was declared free from strategic diseases. The BSS programme also took account of the support from the forage resource availability which was expected to support optimum cattle production and to develop a more integrated farming system between crop and livestock that had mutual support.

The development of cattle value chain was also one of the expected goals of the BSS programme. This aims to increase the quality grade of the cattle, as well as to support the cattle production to be self-sufficient at the national level. The programme also planned to establish the feed factories as well as to give more attention to the value-added in the cattle market chains. These efforts were also expected to be able to absorb more labour.

The interventions from the BSS programme were delivered through various strategies or activities. The programme coordinated and joined networks with various stakeholders and related institutions. The Government cooperated with banks to support farmers with financial capital for cattle production, and provided experts and infrastructures. Moreover, the programme was supported with capacity-building programmes for farmers and other stakeholders, and development of marketing of cattle and processed products.

To sum up, the PIJAR and the BSS programmes have provided the intervention planning that aimed to increase agricultural production (especially cattle) and to improve smallholder farmers' well-being. The interventions were driven by the spirit of market-led rural development because the interventions involved the strategies to increase farmers' capability to participate in markets. This research helps these types of programmes by providing an understanding around the implications of the programmes. That related to how the interventions blended in farmers' livelihoods and shaped farmers' responses to the interventions. This helps future interventions to deliver more effective and efficient programmes to achieve the desired goals.

5.3. Characteristics of Dompu District

This research was undertaken in Dompu Regency which is an area in Nusa Tenggara Barat Province, Indonesia. The two cases (the Transmigratory and the local cases) are

part of this regency, so it is important to provide the physical and socioeconomic characteristics of Dompu Regency. Furthermore, this section provides the specific characteristics related to the findings of this study such as the Mt Tambora and savannah (the main grazing land), the Transmigration programme, financial institutions, and corn and cattle development programme in Dompu.

5.3.1. *Physical characteristics of Dompu*

Most of the Dompu area was in Sumbawa Island, and the other area was Satonda Island. Dompu and Bima regencies shared the area of Mount Tambora and the savannah (the main grazing land) at the foot of the mountain. The total area of Dompu was 2324.55 km² or 11.53% of the total area of NTB province. The altitude of Dompu is between 15 and 62 meters above sea level. Geographically, Dompu lies between 117° 42' – 118° 30' east longitude and 5° 54' – 8° 04' south latitude. There are around 122 rivers and creeks in the district which are used for agricultural purposes. The climate of Dompu is tropical; having a wet season and a dry season. Moreover, the highest rainfall has been 273mm per-month.



Figure 5. 2 Map of Dompu. Source: Susi Nurhairyah⁷

⁷ <https://www.bimakini.com/2017/04/202-tahun-dompu/>

5.3.2. *Mt Tambora: mount and savanna (the common grazing land)*

Mount Tambora is the largest mountain in Sumbawa Island. Based on the Decree of the Minister of Environment and Forestry 111 / MenLHK-II / 2015 April 7, 2015, the Tambora area was approved as one of the National Parks of Indonesia. The nature reserve is 23,840.81 hectares, the wildlife reserve is 21,674.68 hectares, and the hunting area is 26,130.25 hectares. The western area of Tambora is part of the Dompu regency area while, the eastern part is in the Bima regency area.

Tambora is rich in vegetation and animals⁸. In terms of flora, it is dominated by dry, evergreen forests at an area of up to 700m masl. Above 700m masl to 1200 masl, the land is mainly covered by secondary forest which is dominated by bush, shrub, and grass species. In this vicinity, it is a savannah landscape. Tambora has rich types of animals (fauna), especially deer, birds, boars, and reptiles. Farmers also graze large livestock (cattle, buffaloes, and horses) around this locale.

The travelling distance between the capital city of Dompu and Tambora (the grazing land) area is around two hours by car or motorcycle. The area of Tambora can be accessed through three posts, which are Kore, Kawinda To'i, and Doropeti.

⁸Source: Ministry of Environment and Forestry, the Department of Conservation of Natural Resources <https://bksdantb.org/117/10/taman-nasional-gunung-tambora-kabupaten-dompu-dan-bima/>



Figure 5.3 The main grazing land with the Mt Tambora view. Source: Weekdays Traveller Blogspot

In dealing with the problems of less access to land and forage crops during the rainy season, cattle farmers in Simpasai have several alternative means of feeding their cattle. Some farmers send their cattle to Doro Ncanga at the foot of the Tambora Mountain for grazing. Doro Ncanga is the largest grazing area in Dompu. It is located in Pekat district, which can be reached by vehicle, taking two to three hours. The grazing area in Doro Ncanga is a *tanah ulayat*, or an indigenous land which has been freely used by people to graze their livestock over many years. During the rainy season, grasses and many other forage crops grow well in the area, which are good for the animal growth there.

5.3.3. Social characteristics of Dompu

The population of Dompu District was 238,389 in 2016, with 120,521 men and 117,865 women. The total growth rate of population during 2014-2016 was 1.56%, where the male population increased by 1.71% and the female population by 1.45%.

In 2016, the population density in Dompu was 102 people/km² and the average number of family members was four people. The density varied in different spots in this district. The lowest density was 38 people/km² and the highest was 243 people/km². The increasing number of households was 1.48% per-kilometre between 2014 and 2016.

The majority of people were Muslims (98%), and the rest of the population were Hindu, Christian, Catholic, Buddhism, and some other religions. Most of the people in this district were the local tribe or Mbojo, and there were people from other tribes which migrated into the area; these included Sasak (from Lombok), Javanese, Balinese, Samawa, and other tribes from other areas in Indonesia.

5.3.4. *Types of agricultural and non-agricultural commodities in Dompu regency*

Agriculture was the sector that absorbed the most labour in Dompu (more than 50% of the total labour). Agricultural development in this area aimed to increase farm production as well as farmers' well-being. Various initiatives have been implemented by the Government to support farmers to achieve self-sufficiency of some agricultural commodities, to enrich the variety of commodities, to increase exports, and to increase the number of labourers employed in this sector.

In 2016, there were 44,802 ha of farmland, with 29,547 ha for corn and 720 ha for cassava. The area for growing peanut was 1,047 ha and increased 131.64% within a year, while the area for growing mung bean was larger than the area for peanut farming which was 3,038 ha. On the other hand, the perennial crops (trees) were dominated by coconut, cashew nuts, and coffee.

The population of livestock was dominated by cattle. In 2016, there were 88,615 cattle, 22,078 buffaloes, 9580 horses and 70,271 goats. Compared to 2014, the increasing production of all livestock was up by 18%, except for the production of cattle was reduced by 7.89%.

The livestock export was dominated by cattle and goats. In 2016, the number of livestock being exported was 5,210 cattle, 604 buffaloes, and 51 horses. The export of livestock in 2016 increased significantly while, in 2012, none of the livestock were sent out from Dompu.

5.3.5. *The Transmigration Programme in Dompu*

Transmigration is defined in Law number 3 Article 1, 1972 as “transferring people from one region to another within the territory of the Republic of Indonesia for the benefit of the development or for reasons deemed necessary by the government” (BPK RI, nd, p.3). The Transmigration programme has been funded by the central Government since it was initiated in 1972. Originally, the Transmigration programme in Indonesia started from the Netherland’s colonialism in 1905 (Fearnside, 1997). The aim of the programme was to move people from the populated islands such as Java, Madura, Bali and Lombok to outer and small, less populated islands of Indonesia for the equitable distribution of population (Fearnside, 1997). This was supported by several laws of the Indonesian Government, for example, Law number 3 Article 1, 1972 sets out the basic rules of the Transmigration programme (BPK RI, nd). The rules included the criteria of suitable participants to join the programme, the facilities provided and other things related to the establishment of the transmigrants in new places. Since then, many households have joined the programme, where the main destinations were large islands such as Sumatera, Kalimantan or Borneo, Sulawesi and Irian Jaya (Fearnside, 1997).

In the implementation of the Transmigration programme, the central Government coordinated with the provincial and regency governments (Mr Lesmana, the Transmigration Department officer). The budget came from the central Government through the national Government budget or APBN (Mr Lesmana, the Transmigration Department officer). The funding was to support the whole process of the programme’s implementation (Disnakertrans NTB, 2009). For the transmigrants, the Government covered costs such as participant recruitment and transport costs associated with moving from the original location to their destination (Disnakertrans NTB, 2009). The transmigratory families were also supported with basic facilities to establish their daily life such as clothing, health insurance, bedding, and input supplies for gardening (food crop seeds, fertilizers, and farming tools) (Disnakertrans NTB, 2009). In the destination area, the Government provided land and housing, movement, adaptation process and livelihood development (Disnakertrans NTB, 2009).

The central Government provided the necessary infrastructure such as roads, sources of water, housing, electricity, and schools in the destination area (Mr Lesmana, the Transmigration Department officer). The Transmigration Department coordinated with other relevant sectors to provide the facilities. For example, the Department only provided a primary school but, for the higher education levels, the Education Department handled them.

The Transmigration programme within the same province was initiated around 1982-1983 (Mr Lesmana, the Transmigration Department officer). A local transmigration enables the movement of people inter-locations, or islands, within the same province (Mr Lesmana, the Transmigration Department officer). This was the initiative of the Bupati, or Mayor of Dompu, who took office at the time to move people from Lombok Island to Dompu (Mr Lesmana, the Transmigration Department officer). Dompu is in Sumbawa Island, and both Sumbawa and Lombok islands are in West Nusa Tenggara (NTB) province. The idea of making Dompu a destination was in accordance with the initiation of the cashew nut development programme in the regency (Mr Lesmana, the Transmigration Department officer). The cashew nut project was funded by a plantation company owned by the central Government. It was expected that the transmigrants would manage cashew nut farms on the land which was provided for them by the Government (Mr Lesmana, the Transmigration Department officer). The project would be helped in terms of labouring and farming management (Mr Lesmana, the Transmigration Department officer). The farmers would later sell the yield to the plantation company (Mr Lesmana, the Transmigration Department officer).

The first transmigratory destination in Dompu was in Lanci Village (Mr Lesmana, the Transmigration Department officer). Kampasi Meci was not a village at the time, but it was included in the Lanci area. There were 500 households from Lombok which were moved on to Dompu:

“Berdasarkan Peraturan no 2 tahun 1973, porsi dari transmigran berdasarkan asal harus memenuhi persyaratan 80:20, atau 80% dari rumah tangga transmigran berasal dari Dompu, dan 20% adalah warga asli.” (Mr Lesmana, the Transmigration Department officer, min 35:07)

“According to the Law no. 2 of 1973, the portion of transmigrants based on the origins must meet the 80:20 requirements, or 80% of the transmigrant households were from outside of Dompu, and 20% were native families.” (Mr Lesmana, the Transmigration Department officer, min 35:07)⁹

Therefore, out of 500 households moved into the area, 400 families were transmigrants from Lombok and 100 families were from the local Dompu. Transmigrants were supported gradually for five years by the Transmigration Department until they were settled in (Mr Lesmana, the Transmigration Department officer). After five years, the Dompu Regency Government took over the development in the area (Mr Lesmana, the Transmigration Department officer).

In the first year of moving, each household received a hectare of land, which was a yard of 2,500 m² or 5,000 m² to build a house and 0.75 or 0.50 hectare of farmland (Mr Lesmana, the Transmigration Department officer). The Government also provided some basic needs such as food and groceries. Each person received a different amount of rice per month. The head of household received 17.5 kg, the wife received 10 kg and the children received 7.5 kg per month per person (Disnakertrans NTB, 2009). Each family also received soy sauce, oil, dried fish, salt, sugar, soap, and fuel for stoves (Disnakertrans NTB, 2009). In the same year, the Government provided household equipment such as bedding, bathing and kitchen appliances as well as farming equipment and inputs to use on the land (Disnakertrans NTB, 2009).

In the second year, the transmigrants received another piece of land (Mr Lesmana, the Transmigration Department officer). It was a hectare that was not yet cleared from bushes and trees (Mr Lesmana, the Transmigration Department officer). The Government assistance focused more on supporting farm management from years two to five (Disnakertrans NTB, 2009). Each household received seeds for seasonal crops such as rice or legumes (Disnakertrans NTB, 2009). The Government also supplied seedlings of trees (Disnakertrans NTB, 2009), such as cashew nuts. Further, the

⁹ Participant quotes have been translated into English from Bahasa Indonesian by the researcher. Those are from the direct quote of a participant in Bahasa or translated by a research assistant into Bahasa from a participant's local language. For some quotes where the participant spoke in Bahasa the original quote is included along with the English translation.

Government was responsible for providing extra assistance whenever the transmigrants faced crop failures within the five year programme (Disnakertrans NTB, 2009). Each farmer household received rice from the Government to cope with the failures (Mr Lesmana, the Transmigration Department officer). In the third year, the land certification was started and, in year five, all households received the certificate of land ownership.

Beforehand, the Government released an area to locate the Balinese community to live in the same neighbourhood (Mr Lesmana, the Transmigration Department officer). It was expected that the strategy would enable the people to soon adapt because the Government believed that they had the same sociocultural norms and religion so that they were used to each other (Mr Lesmana, the Transmigration Department officer).

In short, Dompu was the first transmigratory destination in Indonesia, where the transmigrants were from the same province, NTB. The Transmigration programme was managed by the Transmigration Ministry by using the national budget. The idea of this kind of transmigration was to help the cashew nut development programme, in terms of the farm and labour management. The transmigrants were provided with various supports which were given gradually over five years until the people adapted to the new place. Once they were settled in, the local government took over the responsibility for further development.

5.3.6. *Development initiatives for cattle production in Dompu*

This research found that the central, provincial and regency Governments had separate funds and programmes to support cattle farmers to increase the population of cattle in Dompu regency. At the implementation level, the distribution of the available funds was managed by the Livestock Department (*Dinas Peternakan*). The funds from the central and provincial Governments aimed to provide cattle grants, free vaccinations, cattle card-making, healthcare, and artificial insemination (AI) services. The funds provided by Dompu Regency Government were mostly allocated to support governmental administration, such as staff honorariums, operational costs, and office facilities.

a. Cattle grants

The Government provides cattle grants for smallholder farmers every year in Dompu. The grants were distributed through farmer groups by the Livestock Department. The cattle grants sometimes came from the central Government and the NTB provincial Government; the main sources of the grants were from Members of Parliaments' aspirational funds. The aspirational funds were provided by the Government to Members of Parliament (MPs) at the central, provincial and regency levels, which were distributed to the constituents (the people who voted for the Parliament members in the election). The aspirational funds aimed to accelerate the Government programme implementations at the community levels. The Members of Parliament listened to the constituents' requests for what they needed to support their livelihoods. Hence, the MPs believed that the strategy of distributing funds for constituents through the aspirational fund programmes was more efficient to achieve the Government's development goals.

The local government distributed cattle to farmer groups based on proposals submitted to the Livestock Department (Dinas Peternakan) of Dompu regency. To obtain a cattle grant, farmers were required to establish an official group and write a proposal to the local government. The proposal needed approval from the supervisors of the groups, the head of the Livestock Department at the district level (UPTD), and the head of the village. Through the Livestock Department, the Government assigned some staff to visit the farmer groups who were applying for the grants. The staff members then verified the presence and the qualifications of the groups. The qualified groups were those who provided the groups' stalls, a source of water and other relevant facilities to raise cattle that would be granted. If the groups' qualification met the requirements of the Government, the eligible groups received the cattle grant for which they applied. The number of granted cattle varied. Each farmer group member could receive from 1 to 3 cattle.

The group members usually reared their cattle together with other group members for the first one to two years later, they kept the cattle in their own farms or houses where they became their private property, and sold the cattle when they needed a large amount of financial support. In this case, The Government initially expected that the

granted cattle to the targeted groups were for breeding and passed the cattle to other members some members received the benefit from breeding. However, the Government faced difficulty in setting strict regulations related to the distribution of the cattle grants. The farmers assumed that any assistance from the Government was a voluntary grant for them. Thus, farmers did not hesitate to sell the cattle, which basically violated the Memorandum of Understanding (MoU) between the Government and farmer groups before they received the grant.

“...there were some members sold the cattle they received (from the Government), but the people from the Dinas suggested me not to sell the cattle. Since that time, I have raised cattle and resulted in more cattle. I can cover my family daily life from raising cattle.” (Mr Amanulloh line 60-63)

The Government tried to impose sanctions on farmer groups for selling cattle for unacceptable reasons. Nevertheless, these rules were very difficult to implement because these programs were annual, not sustainable, multiple, and in constant violation of the rules. Therefore, imposing sanctions by the Government was difficult to implement.

In summary, the cattle grant programmes offered by the Government faced the same problems over time. However, the Government continued to apply the same mechanisms for the cattle grant implementation to date, despite the fact that the mechanisms were considered less effective. The Government had been failing to apply decisive actions for those who breached agreements between the Government and farmer groups.

b. Vaccination, cattle card-making, health services, and artificial insemination (AI)

Vaccination and cattle card-making are routine annual activities of the Livestock Department (Dinas Peternakan) of Dompu regency. The funds come from the regency revenue budget (APBD II) which is combined with the Provincial Budget (APBD I). The vaccination and card-making are free services for farmers and were originally separate government programmes. However, they are usually conducted at the same time for

efficiency. The purpose of vaccination is to prevent *Anthraxnose* disease and *Septicaemia epizootica* (SE) in cattle, and a cattle card (certificate) is a proof of cattle ownership. Each of the cattle in Dompu has a card, which expires, and must be renewed annually. That is because the physical characteristics of each cattle keep changing. On the card, the physical characteristics of the cattle and the date of vaccination for livestock are recorded.



Figure 5. 4 Cattle vaccination. Photo by Drh. Agus Mulyadi

KARTU KEPEMILIKAN	
NAMA	SILATIF AHSYAD
UMUR	
DESASEP	BAKA JAYA
KECAMATAN	WIS
NO. TER	
SEESOR	
KELURUH	
UMURKORDI	
DENGAN TANDA - TANDA	
WARNA BULU	Kerah Putih
TANDUK KUIS	ada
TANDUK KANAN	ada
TELINGA KIRI	ada
TELINGA KANAN	ada
CATATAN	
SINGKOR _____ WAKA _____ WOKRA _____ PUSAKAN DAPR _____ KULTI _____ WAKA _____ PUSAKAN RAJAWANA _____ KULTI _____ WAKA _____ CONDORORA _____ KULTI _____ WAKA _____ KANDONGE _____ KW _____ ESE _____ AWI _____ TANDA KHUSUS _____ PR _____ KULTI _____ AWI _____ TEME _____ CAP _____ TANGGAL TERPAY / VAKINASI _____ ANTRAK _____ SE _____ PERKETAHUI _____ KEPALA DESA/LURAH _____ KEPALA UPTD _____ NIP _____ NIP _____	

Figure 5. 5 Cattle card (front)



Figure 5. 6 Cattle card or certificate (back)

The Government arranged vaccination simultaneously with cattle card-making every year. This was a strategy to make the arrangement easier for both the farmers and the field staff because farmers spent time, money and energy catching their cattle and gathering them in a certain location before treatment. Moreover, the strategy of arranging the two activities at the same time was also more efficient because there were some other activities such as extension and healthcare services that could be implemented.

The Government arranged these two services (vaccination and card-making) in groups, and provided these services individually when needed for free. Farmers could come to the Livestock Department at the district level (UPTD) office and ask for vaccination or card-making services. The farmers could also contact the officers by telephone for the visiting services. However, some farmers did not feel that they should vaccinate and certify their cattle. The farmers who missed the events usually did not try to ask the officers to vaccinate or to certify their cattle individually.

“Me: were you absent from vaccinating your cattle?”

Farmer: Yes, I have. I had another job (at the time).”

Me: did you go to the Dinas [to get the vaccination] later on?

Farmer: No, I didn't. I waited until the next vaccination in the following year." (Mr Jamal, line 343-346)

When farmers wanted to borrow money, they contacted field officers to make cattle cards as well as applying for the vaccination, as the bank credit programmes required cattle certificates for collateral.

Farmers who sent their cattle to Doro Ncanga considered the certificates very important for if they wanted to bring their cattle back home during the dry season, they had to show the cards (certificates). The cards were also considered important by middlemen when they wanted to sell their cattle out of Dompou, or to bring the cattle from Doro Ncanga as providing the cards proved that the cattle were not stolen.

The arrangement of the vaccination and cattle card-making in the grazing areas in Doro Ncanga was slightly different. Owing to the very large area of Doro Ncanga and the various farmers' origins, the UPTD of each district visited, and provided services for the cattle that came from the same district. For example, officers from the UPTD Woja district came to Doro Ncanga to vaccinate and certify cattle from Simpasai village, Woja district. However, for the healthcare or emergency health cases, farmers usually called the veterinary staff at the UPTD Kempo, which was the closest official unit from Doro Ncanga.

"Healthcare has been provided in every UPT or UPTD, including the vet staff. The field officers [in Doro Ncanga] will help farmers as far as they contact us. Farmers usually call the officers that they use to contact." (Mr. Haris line 151-154)

The Synchronizing Oestrus and Artificial Insemination (GBIB) was a flagship program of the central Government to increase the number of cattle population in all provinces in Indonesia. Cattle farmers, whether they were individuals or groups, were entitled to receive free artificial insemination for their cattle. In NTB province, GBIB was aligned with the NTB provincial Government programme, PIJAR. The GBIB's activities included injection of stimulating hormone for cows and followed by artificial insemination (AI).

c. Market for cattle

To increase cattle population in NTB, the Government implements policies to support the targeted population achievement. A million cattle land (BSS) programme is an example of the Government initiative in NTB that aimed to achieve a million cattle in 2013. However, the the increase in cattle production in NTB is slow. Although the provincial government claimed that the target of a million cattle population has been achieved in 2013, the Statistics Bureau reported that between 2011 and 2013, the population in NTB had reduced from 791,219 to 726,914 head of cattle. In Dompu, the statistics reported that the population was also reduced from 87,346 to 83,564 head of cattle. Those included beef cattle, dairy cattle and buffalo. This research found that the local sociocultural norms have influenced the way the cattle farmers in Dompu respond to government initiatives and achieve a lower population than expected. This section describes how and why the sociocultural norms influence the Government initiative.

Farmers prefer to keep female cattle for breeding and sell the male cattle at any size when they need money. While raising male cattle for fattening, farmers are expected to sell their cattle regularly, as an ongoing source of income. However, if farmers do not consider that cattle are a regular source of income, it means the cattle will not be sold unless they need money. If necessary, they will even sell female cattle if they do not have male cattle at the time. This also becomes a question that will be explored in this study: why those strategies do not increase the number of cattle in this area?

Fattening is not preferable because it needs intensive care and the cattle are kept in the sheds. *"I don't want to do cattle fattening because it's too complicated. I have too many things to do."* (Mr Setya, line 257). Farmers prefer grazing their cattle because they can pursue other sources of income-generating activities. Moreover, the cows can mate naturally and deliver calves every year, and these will double the number of their cattle.

For the male cattle, they sell them to middlemen (*pelele*) and they then go to larger buyers in Bima. The larger buyers ship male and female cattle and their calves outside of the island. They usually do not market male cattle on the island because there are larger market opportunities for the male cattle outside of the island. Thus, the male cattle leave the island and are slaughtered elsewhere. There is a rule around the cattle

transporting outside of Dompu in that the weight is supposed to be a minimum of 150 kilograms, but farmers do not follow that. This has reduced the number of male cattle in Dompu, including Simpasai.

The other common practice in Dompu is slaughtering productive or non-productive female cattle, which goes against the Government rule. The local government controls the slaughtering of productive female cattle (Local rule of NTB province no. 1 year 2015 about controlling the slaughter of productive female cattle). Productive and healthy female cattle are not allowed to be slaughtered, in order to increase the cattle population. However, the slaughtering of female cattle in NTB is still happening. Firstly, male cattle in Dompu are rare because smallholders prefer to sell male cattle first when they need cash and keep female cattle for breeding. This leads to slaughtering female cattle by butchers. Secondly, butchers prefer females because they get much more profit from them compared to male cattle, especially from the intestines. Butchers sell intestines because people eat them. In terms of the price, butchers prefer female cattle because live male cattle are more expensive than female ones at the same size. Moreover, the butchers in this study felt that the brain size and the intestines of female cattle at the same body size as male cattle were bigger than the males.

In this study, it is identified that the infrastructure of livestock markets in Dompu regency were not used as the markets in Lombok Island. The Government has tried to build a livestock market in Dompu, but the market is not used as a place to do a transaction, whereas, the Government has provided various necessary facilities in the livestock market such as weighing equipment and sheds. However, the facilities provided by the Government are not suitable with the cattle marketing mechanism. Hence, this has caused unsuccessful efforts to encourage the development of livestock markets in the regency. For example, weighing cattle is inconsistent with the tradition of cattle pricing among farmers and buyers. Breeders and buyers rely on their ability to project prices based on the physical appearance, not on the weight or age of cattle. With the care employed in measuring the appearance, each party has a chance to gain far greater profit than scaling them up. Moreover, farmers and *pelele* (middlemen) are more satisfied doing the normal way of making transactions.

The reason that farmers do not want to sell their cattle to the livestock market is because they must meet some requirements such as paying certain kinds of fees or taxes.

“saya: kenapa pasar ternak di pulau sumbawa termasuk dompu ini tidak bisa berkembang?

Dia: terlalu ribet aturan kita. kalo masuk ke pasar kan dikenai biaya segala macam. Harus dikarantina dulu untuk menyatakan sapi itu layak... Mereka harus nginap di sana, harus dikasi makan segala macam kan. Mereka keluarkan biaya sendiri lagi.” (Mr Akramul Karim, line 581-589)

“Me: why can’t the markets in Dompu be used as expected?

The officer: our rules (the government rules) are too complicated. Farmers have to pay many kinds of fees. Their cattle have to be quarantined... They (farmers) have to stay overnight there, look after their cattle when they are there (in the market) with their own expenses.” (Mr Akramul Karim, line 581-589)

The requirements make farmers feel that the entry into the livestock market is more complex. Therefore, they prefer to call a *pelele* because it is more convenient. They simply use a mobile phone to contact a *pelele* and make the transaction. The *pelele* will then come to the farmer’s property with their truck soon after they are contacted. Moreover, farmers are not the actors that always lose in the cattle trade; instead, they have bargaining positions as there are many *pelele* looking for cattle in their village at any one time. The bargaining process between farmers and a *pelele* usually happens several times so that they can choose other *pelele* if they do not like the price offered by the previous ones. Nevertheless, some farmers believe that *pelele* have a price agreement among them because the prices offered from one *pelele* are not much different from others.

The price offered by *pelele* is also better than the price from slaughterhouses. That is why farmers prefer not to sell their cattle to slaughterhouses unless their cattle are sick, badly injured or having problems in giving birth and need to be slaughtered

immediately. Butchers will be happy to accept those kinds of cattle because the price drops significantly. Cattle that cost about IDR 6-7 million could fall into IDR 2-3 million. Sometimes, *pelele* will also buy sick cattle from farmers and take them to butchers or slaughterhouses, and receive little profit from the butchers.

Meanwhile, *pelele* believe that farmers can only sell their cattle to them because the farmers will face difficulty in selling their cattle directly to the next buyers, especially the bigger traders (wholesalers) who export cattle outside the Island because of the farmers' lack of negotiation skills.

"[Peternak] pasti tidak bisa [menjual langsung ke pedagang besar] karena yang tahu standar harga kan kita (pelele)... Mereka (peternak) hanya tahunya jual saja [ke kami]... mereka grogi kalau ketemu pengusaha.

"... [Farmers] can't do it [selling cattle directly to wholesalers] because only us (pelele) know the price standard ... They (farmers) only sell to us ... they are not able to talk [for negotiation with the wholesalers]" (Mr. Hajarwadi, p. 17, line 608-613).

Hence, *pelele* believe that farmers can lose out in bargaining, and only they can negotiate with big traders or cattle companies. On the other hand, farmers' reason to sell cattle to *pelele* is because they feel more convenient to sell their cattle to them because they can save transportation cost and time for travelling.

In conclusion, cattle marketing actors in Simpasai have a special arrangement. Physically, livestock market cannot be used as expected and marketing actors keep the normal trading system among them. In setting cattle prices, the price is based on the actors' ability to assess the physical performance of cattle instead of scaling them up. In addition, the existence of a *pelele* is very important. *Pelele* is a traditional term for collectors or traders in market chains. They usually run a small-scale trading business. Most of the farmers have not been able to meet directly with big businessmen to sell their cattle because of the availability of the *pelele*. However, farmers consider a *pelele*'s services more convenient when compared to other types of marketing. This is due to more effective use of mobile phones and free transportation services from *pelele*.

5.3.7. Formal and informal financial institutions in Dompu

Financial institutions play important roles in supporting farmers' livelihoods. People in Dompu could access both formal and informal institutions in order to help people to fulfil their financial needs. This section provides examples of farmers' access to financial supports which include credit facilities and pawn shops.

a. Credit facilities

A credit programme that was found in this study was called *Kredit Usaha Rakyat* (KUR) or credits for people's economic activities. "Kredit Usaha Rakyat (KUR) is a credit/financing for a business and/or an investment to individual/individual debtors, business entities and/or business groups that are productive and feasible but do not yet have additional collateral, or the additional collateral is not sufficient" (Coordinating Ministry for Economic Affairs, nd. Para.2). KUR requirements are easier than other creditors' requirements. Debtors only need to provide their citizenship approval and cattle or motorcycle certificates. The loan period of KUR is longer than for loans from *rentenirs*, which were six months for food crops and 12 months for livestock. The amount of a loan from the KUR programme is higher than can be obtained from *rentenirs* (informal or traditional money lenders who get high interest from the people who borrow money).

b. Pawn shop

The most common pawn service in Indonesia is "*Pegadaian*", that is a private institution in Indonesia established in 1746. Recently, pawn shop services have been more accessible because they have been available at district level all over Indonesia. The services provided are various, not only for pawning, but also for saving or buying gold. People who have particular assets (gold, land, vehicles, and so on) can make a pawning transaction in this institution (Pegadaian, nd)¹⁰. This is helpful for many people who do not have many assets to get cash whenever they need.

¹⁰ www.pegadaian.co.id Accessed: 28 August 2020

5.3.8. *Characteristics of the Transmigratory case*

The case of the Transmigratory was represented by Kampasi Meci village. This village was chosen because it represents other areas in Dompu, where most farmers raised cattle as one of their livelihood assets. Moreover, farming them was one of the farmers' livelihood strategies. This village was dominated by transmigrants, especially from Lombok Island. This section provides the physical and socioeconomic characteristics of the village from where the participants that represented the Transmigratory case were chosen.

a. Physical characteristics of the Kampasi Meci village

The transmigratory case is located in Kampasi Meci village that was one of the destinations of the transmigration Programme in the past (see Fig 5.2 Map of Dompu). The village is about 20 km from the capital city of Dompu, and 84 km from Mt Tambora and Savannah (the main grazing land). The area is 7.35 km² or 0.32% from the total area of Dompu regency with an altitude of 125 m above sea level.

Dompu is a tropical area with two seasons which are dry, and wet or rainy seasons. On average, there are nine rainy days per month with 91 mm precipitation. The wet season is usually from November to August, and February to April has the higher rainfall period. The farmland was dominated by rain-fed and non-irrigated land on which farmers grow crops once a year. None of the irrigated land was available in the village.

b. Socioeconomic characteristics of the village

In 2016, the total population of Kampasi Meci village was 1,965. Compared to the other villages in Dompu, the population density of the village was relatively low; 267 people/km² in 2016. The number of men and women were almost equal; the male population was 992 while the female population was 973. The number of young people (up to 15 years old) was 717, and above 59 years old or more was 114. The population was dominated by a productive age group (16-59 years old) being 1134. According to the data between 2016 and 2017, the number of births was 69 and deaths were 12. There were five people who had moved out from the village, thus, the population

growth was higher than the reduction of population. The average growth rate per year was 1.3% between 2013 and 2016.

The number of households in Kampasi Meci was 487 in 2016. Most of them used wood for fuel for cooking, and a few of them used kerosene stoves. However, none of the households used gasoline for fuel. All of the households in the village already had electricity installed, especially for light and electronic purposes. In terms of water, all of the households relied on wells and artesian wells. Later, there was a water installation that was managed by the village government, and each household had to pay for the service in order to get it connected to the house.

The majority of the population in Kampasi Meci were Muslim, with only four people who were Hindu, and they came from Bali Island. Most of the people in the village were originally from Lombok Island. The village had three big mosques (a public building for praying).

Kampasi Meci is the village with low economic growth. Although the agricultural sector is unstable because of the reliance on climate, most people relied on the food crop farming activities such as growing rice and/or maize. Most farmers grew corn rather than rice and, if soil water was still available after the main crop, farmers grew other types of food crops that were more tolerant to drought such as mung bean. In terms of perennial crops, Kampasi Meci was dominated by cashew nut trees. With respect to livestock farming, farmers commonly raised cattle, horses, and goats. There were 762 cattle beasts or 1-2 cattle beast per household in average kept by the farmers in the village in 2016.

c. Kampasi Meci: one of the transmigration sites in Dompu

Kampasi Meci was one of the sites for the Government transmigration programme in Dompu, which was conducted between 1982 and 1983. This village was a relatively new village which became administratively independent in Dompu in 2010. Previously, this village was a part of Nusa Jaya village.

The Transmigration programme was initiated in the early 1980s and, as such, there were new generations arriving in the village (some of the transmigratory families have already had children and grandchildren during the time the study was conducted). The older generation was made up of the people who migrated to Kampasi Meci in the early 1980s and, in this research they are called “the first generation”. The younger generations (second and third generations) were the descendants of the first generation. The younger generations often inherited land or houses from their parents but, sometimes, parents would give them their assets when they were still alive. Both generations mostly worked in the agricultural sector. However, the younger generations were taking advantage of new opportunities outside of agriculture to improve their livelihoods. These activities included employment as migrant workers overseas, selling meatballs (*bakso*), or peddling groceries.

d. The first generation of Transmigratory families

The first generation who came to Kampasi Meci in the early 1980s were similarly motivated to migrate to the area and establish their livelihoods. They wanted to improve their livelihoods and increase their well-being in Kampasi meci. They started a new life by establishing farms that were granted to them by the Government. Some of the migrants sold their assets in their places of origin (i.e Lombok Island) and used this capital to support their livelihood strategies in Kampasi Meci.

Before the current Bupati or Mayor of Dompu took office in 2010, the Government focused on rice production as a key extension strategy. This was because rice was the staple diet of most people in Dompu, and in Indonesia. As part of this programme, farmers received free seed and fertilizer each year. Farmers could only grow one crop of rice per year because they were reliant on rain-fed agriculture. The rice yield was sufficient to cover a household’s annual food requirements. However, farmers’ failure to predict the beginning of the wet season often led to the crop failure. This made farmers suffer from food scarcity for daily consumption. To overcome this problem, farmers in the village helped each other through what is known as *gotong-royong*.

Gotong-royong means “to help each other”, which is a sociocultural norm in Indonesia where people help each other in times of difficulty. The *gotong-royong* tradition is still

strong in this village. When a neighbour lacks food, they receive food or borrow groceries or money to help them survive periods of food scarcity. *Gotong-royong* is also considered as reciprocity. Farmers, who have received helping hands from other farmers on their land, were expected to help other farmers in return. Farmers, who grew crops, did not pay the other farmers who helped them, but the farmers provided food for those who were helping.

Since 2010, the Dompu Government established corn as one of the flagship programmes along with cattle development. Since the establishment of corn as a key agricultural crop, the tradition of *gotong-royong* culture had declined. Rather than helping each other with cropping activities, farmers employed labourers at peak times.

e. The second and third generations of transmigratory families

Second and third generations were the descendants of the first generation (children and grandchildren). As with the first generation, the younger generations mostly relied on the agricultural sector. Their main livelihood activities involved the growing of corn, farm labouring for other farmers, and the raising of cattle. The assets and livelihood strategies were used by these generations, similar to those of the first generation. However, there were several differences that occurred among those generations. The younger generations had expanded their livelihood strategies with some becoming vendors or going overseas to do migrant work. Moreover, assets they owned were more diverse.

5.3.9. Characteristics of the Local case

Simpasai is the village where the participants from the Local case were living during the research. This village is dominated by the local people. This section provides physical and socioeconomic characteristics of the village to give a better understanding of the farmer participants in the Local case.

a. Physical characteristics of the village

The Local case is located in Simpasai village, Woja sub-district (See Fig 5.2 Map of Dompu). The village is two km away from the capital city of Dompu district. The area of

Simpasai is 4.32 km² or 0.86% of the total area of Dompu Regency. Geographically, Woja sub-district is located between 117° 30 and 118° 30 longitude east (west to east), and from 8°04 to 5°54 latitude south (north to south). The distance between Simpasai and the grazing land in the feet of Mt Tambora is 111 km. The distance between the Transmigratory and Local cases is around 16-20 km. The altitude of Simpasai is 50 m with two main seasons (dry and wet or rainy season). The average rain was 13 days per month in 2016, and the wettest days were from October to July in the following year.

b. Socioeconomic characteristics of the village

The population of Simpasai was 7,691 with a density of 1780 people/km² in 2016. The male population was 3938, while the female population was 3735. Among the total population, most of them were in the productive age group that was 5295 people between 15 and 59 years old. The number of people under 15 years old was 2711 and above 59 years old were 453.

In Simpasai, there were 1893 households with an average of four family members per household. The number of births was 21, deaths was three, moving out was 15, and no-one moved in. The population growth rate fluctuated in five years between 2013 and 2016. The population increased from 1.2 (1794 people) to 1.7% in 2013-2014, and then it decreased to 1.1% (1893 people) in 2016. Among the households, 88 couples got married and no couple divorced in 2016.

The majority (97%) of the households in Simpasai are Muslim, and the majority of are native local people of Dompu. It has six mosques and a Hindu temple. In terms of education facilities, the school facilities were provided in this village from kindergarten level to the senior high school level.

For household purposes, the people in Simpasai used fuel and wood for fuel for cooking and electricity for light and electronic devices. The majority of households cooked by using kerosene for fuel and some were still using wood. For electronic purposes, most of the households had access to electricity while only a small number of households did not have access. In terms of access to clean water, the Government provided a clean

water installation (PDAM), to which 621 households had access. Other households used artesian wells (415 households) and wells (803 households).

Economically, Simpasai was categorised as well-developed, with the main source of income from agriculture. It has wetland (80 ha) with technical irrigation system so that farmers could grow crops the whole year. The village also had dryland (306 ha), 36 ha for living, and 10 ha for various other purposes.

In terms of the agricultural sector, most farmers use their farmland primarily for growing food crops. In 2016, total farmland being grown was 817 ha. Among the total farmland, 516 ha were wet land and 301 ha were dryland. From the total wetland, only three hectares could be grown three times a year because they used technical irrigation. However, most of the wet land could be grown twice a year because of the availability of irrigation system. The rain-fed land could be grown once a year, of which the total area was 162 ha.

The other commodities in Simpasai village were perennial trees (e.g cashew, coconut, and candlenut) and livestock. For livestock, it was dominated by goats and cattle; 1455 goats, 1252 cattle, 131 buffaloes, and 266 horses.

5.3.10. *Comparisons of the characteristics of the Transmigratory and the Local cases*

This subsection provides comparisons between the characteristics of the two cases in this research, which are the Transmigratory and the Local cases. The Transmigratory community is located in Kampasi Meci village and the Local case is in Simpasai village. The characteristics that are compared and contrasted are related physical and socioeconomic aspects.

The differences and similarities between the two cases are presented in Table 5.1 Overall, in terms of physical characteristics, the Transmigratory case was more rural (more distant from the capital city) and less populated than the Local case. From the socioeconomic perspective, the Local case was more developed than the Transmigratory case. Moreover, the education facilities in the local case were more complete than those in the Transmigratory case.

Table 5. 1 Comparisons of the characteristics of the Transmigratory and the Local cases

No	Characteristics	Transmigratory (Kampasi Meci)	Local (Simpasai village)
1	Physical characteristics		
	Distance from the capital city	Further (20 km)	Closer (2 km)
	Area	Larger (7.35 km ²)	Smaller (4.32km ²)
	Distance to the main grazing land	Closer (84 km)	Further (111 km)
	Climate and seasons	Tropical with 2 seasons (dry and wet seasons)	Tropical with 2 seasons (dry and wet seasons)
	Types of the farmland	Dryland is more dominant	Wetland is more dominant
2	Socioeconomic characteristics		
	Population	Lower (1,965 people)	Higher (7691 people)
	Density	Lower (267 people/km ²)	Higher(1780 people/km ²)
	Population growth rate	1.3% per year	Fluctuate (1.7 to 0.11%)
	Categories of the socioeconomic growth	Low	High
	Dominant religion	Islam (99%)	Islam (97%)
	Dominant tribe	Sasak (native tribe from Lombok Island)	Mbojo (local tribe from Dompu)
	Educational facilities	Highschool	Kindergarten to highschool
	Dominant sector that absorbs labour	Agricultural sector (crop farming)	Agricultural sector (crop farming)
	Types of crops grown	Corn (dominant), rice, mung bean	Rice and corn (dominant), mung bean
	Types of livestock	Cattle and goats	Cattle, goats, buffaloes

	Number of crops grown per year	1-2 times per year	1-3 times per year
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Source: (Statistics of Dompu Regency, 2017)

Geographically, compared to the Local case, the location of the Transmigratory case is closer to the main grazing land, but further from the capital city of Dompu. However, the Local farmers sent their cattle to the main grazing land while none of the Transmigratory farmers sent their cattle there. The Local farmers sent their cattle to an area in their village, especially during the food crop growing season or when they did not have enough labour or space to farm cattle. On the other hand, the Transmigratory farmers preferred to raise their cattle in their village and tethered or put the cattle in stalls during the food crop growing season.

From a social perspective, the population density of the Local case was higher than the Transmigratory case, although the area of the Local case was larger than the area of the Transmigratory case. The population growth rate in the Transmigratory case was stable from 2013 to 2016, at 1.3% per year, and the population growth rate decreased from 1.7% to 1.1%. The majority of the people in both cases were Muslim (more than 90%). In the Local case, a few people were non-Muslim such as Hindu, Christian, Catholics, and Buddhism. In the Transmigratory case, Hindu was the only other religion other than Muslim. The Local case was dominated by the Local tribe which is called Mbojo, while the Transmigratory case was dominated by the Transmigratory people who were originally from Lombok Island (Sasak Tribe).

In terms of economic conditions, the Local case was categorised as a more developed group than the Transmigratory case. The location of the Local case to the capital city and centre of economic activities is closer than the location of the Transmigratory case. The Local case had better access to markets than the Transmigratory case because of the distance to the centre of economic activities. Moreover, the strategic position gave people in the Local case better access to other infrastructures and facilities such as education or main roads.

In both cases, most of the people relied on the agricultural sector, especially food crop farming. Livestock was mainly considered as an investment and a productive asset instead of as the main source of income. The main food crop commodities in the Local case were rice and corn. Rice is the staple food in Indonesia, (including both cases) so that the Government encouraged the self-sufficiency of rice production. Corn was also the main commodity for the farmers in the area because that was supported by the local government development programme at that time. The Government provided many facilities to support the production of those commodities. The supports have motivated farmers to increase the production of both rice and corn. However, considering the types of farmland in both cases, the Local farmers focused on rice and corn, while the Transmigratory case focused on corn production. That was because the farmland in the Local case comprises wet and dryland. Some of the farmland was technically irrigated. On the other hand, the farmland in the Transmigratory case was dominated by dry or non-irrigated land that was not suitable to grow rice.

Seasons and water availability are important for both cases as most people relied on the agricultural sector. In the Local case, farmers could grow crops between one to three times every year. However, in the Transmigratory case, farmers could grow crops up to twice a year. Farmers could graze their cattle around the village outside of the crop-growing season in each village. In both cases, cattle were the most common livestock being farmed among them, followed by goats, horses, and buffaloes.

5.4. Summary of the chapter

This chapter provides a description of the physical and socioeconomic characteristics of the case studies from the provincial to the village levels where the cases are located. Information has been given relating to several special features from this region such as the rural development interventions (the flagship programmes), the Transmigration Programme, and the grazing land. Moreover, this study compares and contrasts the characteristics of the two cases.

The cases of this study are the Transmigratory and the Local cases which are sections of Nusa Tenggara Barat (NTB) Provinces and Dompu district. This province is located in eastern Indonesia that lies between Bali and Nusa Tenggara Timur Provinces. It has

hundreds of islands, but there are two main islands: Lombok and Sumbawa Islands. This research was undertaken in Dompu Regency in Sumbawa Island.

This area has a wet season and a dry season, and the types of farmland are wet (irrigated) and dry (non-irrigated) land. NTB, especially Dompu Regency, focuses on the agricultural sector, and the main commodities are rice and corn. The flagship development programme was the cattle-corn-seaweed (PIJAR) programme, aimed to improve farmers' production in those commodities and farmers' well-being. The development programmes to support farmers were usually delivered through farmer groups, which means access to join a farmer group is important for farmers.

Cattle are one of the Government's focuses on agricultural development in NTB or in Dompu. This regency is supported by the potential resources that support the development of cattle such as natural and social resources. For the majority of the farmers in NTB province, especially in Dompu, cattle are considered as one of the important assets to support their livelihoods. Moreover, the sources of forage in Dompu support the initiative, for example, the savannah at the foot of Mt Tambora is the largest grazing land area in Sumbawa Island.

Dompu community is multicultural, especially since the Transmigration programme was implemented. The Government programme encouraged people from outside of Sumbawa Island to move in and live there. In the past, Dompu was one of the destinations of the Transmigration programme. Most transmigrants were from Lombok Island, and some were from Bali. The transmigratory people work in the agricultural sector, and cattle were an important agricultural commodity upon which they focused.

The cases in this research were located in different sub-districts and bounded by the village. The participants of the Local case were the local people that lived in Simpasai village. On the other hand, the participants of the Transmigratory case were the transmigrants who were dominant in Kampasi Meci village. In both cases, the majority of people are Muslims, and most of them work in the agricultural sector.

Chapter 6: Findings

6.1. Introduction

The research question that drives this study is “What shapes smallholder farmers’ decisions on management of their cattle in an area where cattle development is being promoted by market-led rural development initiatives?” This chapter describes the key findings in relation to this research question for the two case studies: 1) the Transmigratory case and 2) the Local case. These findings illustrate the smallholder farmers’ management of cattle and the factors that influence this from a livelihoods’ perspective. For each case, the role of smallholder livelihoods in shaping smallholder farmers’ decisions in managing their cattle is described first. Once this is clear, the factors that influence the cattle management practices of the smallholder farmers in this case study are described. The Transmigratory case is presented first, followed by the Local case.

6.2. The Transmigratory case

The Transmigratory case is based on Kampasi Meci village. The physical and socioeconomic characteristics of this case is presented in the Chapter 5. There were several factors that shaped the management of cattle in this case. An important influence on the smallholder farmers’ cattle management was the mix of livelihood activities that they used during the year. The mix of smallholder farmer livelihoods are described first so that their influence on the smallholder farmers’ cattle management practices can be set out clearly in the second part of the findings’ section. In this section, the other factors that influence the smallholder farmers’ management of cattle are also described including the role of smallholder livelihoods in shaping their decisions in relation to cattle management practices.

6.2.1. *The roles of smallholder farmer livelihoods in shaping smallholder farmers' decisions on their cattle*

The sustainable livelihoods framework in this study helps in looking at how mix livelihoods of the farmers in this case shaped smallholder farmers' decisions on their cattle. The decisions here included activities that reduced the number of cattle in the farmers' households (e.g. selling, slaughtering, and giving away cattle), and increasing the number of cattle (e.g. buying, acquiring, and retaining cattle). The other related decisions made included nutrition, healthcare, administration, and who look after the cattle. The smallholder farmers in this case had a mix, or a portfolio of activities which were to sustain their livelihoods. Some activities were seasonal so that they had day-to-day sources of income to sustain their livelihoods. The smallholder farmers also had strategies to manage their finances such as different forms of savings, obtaining access to credit as well as obtaining access to government support for their livelihood activities. The mix of livelihood activities used by the smallholder farmers in this case study included crop farming, labouring activities, livestock farming, and alternative sources of income from the non-agricultural sector. To help support their livelihoods, the smallholder farmers also accessed formal and informal credit institutions, and free healthcare insurance. Section 6.2.2 describes the factors that influence the smallholder farmers' management of their cattle.

This section describes how the decisions on cattle by smallholder farmers in this case were shaped by the vulnerability contexts, access and ownership of various assets, and formal and informal institutions. Income activities in the agricultural sector (related to non-cattle and cattle), and non-agricultural sectors are also discussed.

a. *The role of vulnerability context in shaping smallholder farmers' decisions on their cattle*

With respect to decisions on cattle, there were several sources of vulnerabilities in this study which shaped smallholder decisions on their cattle. The vulnerabilities in this case included several external influences such as development trends, seasonality, shocks, and others. They shaped smallholder farmers' options on activities for means of living, which also influenced their decisions directly or indirectly on cattle.

In Dompou, where this study was conducted, the local government focused on corn development as the flagship programme. Most farmers in this area responded to the programme positively, and this influenced cattle production, especially in the wet season. While corn was considered as the main source of income, cattle were not viewed the same as corn; they were perceived as financial support or a means of saving. Cattle were sold to fulfil the farmers' needs during the crop growing season, whether to buy inputs or to support other needs growing the crops. In relation to this condition, seasonality was also a vulnerability context which affected management of cattle. When corn was grown in the village, smallholder farmers experienced limited access to forage and availability of labour. This shaped decisions on the number of cattle. Details about how seasonality shaped cattle production are described later in section 6.2.2.

As cattle were a means of saving and insurance in smallholder farmer households, shocks were a form of vulnerability that often made smallholder farmers sell their cattle to deal with an emergency. The examples of shocks in this study were the failure of crop farming (economic shock) that often happened in this area of the study, and the sickness of family members. These upsets often required a larger amount of cash than what they had. Hence, farmers sold their cattle to deal with the need of financial support. How these vulnerability contexts played out in smallholder-farmers' decisions on their cattle in this case study is explained in more detail in this chapter.

b. Access and ownership of various livelihood assets that shape management of cattle

The smallholder farmers in this study had a mix of different assets for different purposes in their livelihoods. Some of the assets were used for different activities whether were directly related to cattle farming activities or related to other activities but might shape smallholder farmers' decisions on their cattle. As described earlier, the cattle in the rural households were viewed primarily for saving and insurance. The ability of the smallholder farmers to invest in more cattle was influenced by various conditions including the ability to deal with vulnerabilities such as being able to be economically secure, or the ability to deal with unexpected events or emergencies in their livelihoods. The assets that were important for smallholder farmer livelihoods in

this case were farmland, sources of forage, the availability of livestock and cash, and access to credits and inputs for crop growing. The other assets were also important such as the availability of labour, crop yields (corn, rice, beans), water for farming, and social network. These assets were related to the smallholder farmers' income activities to secure their economic condition and to increase their savings which included the form of cattle. How these assets were used in livelihood activities in shaping management of cattle are explained later in the points (d) and about the livelihood activities of smallholder farmers in this case.

Access to farmland in shaping livelihood income activities and decisions on cattle. The majority of the cattle farmers in the study case had their own farmland. They were the first generation farmers involved in the Transmigration programme and were given 2.0 ha of farmland per family when they arrived in the area. Farm size varied between the farmers. Some still had the original 2.0 ha, others had expanded their land holdings and the younger farmers, who were the children of the original settlers, had smaller operations (< 2.0 ha). Some of the cattle farmers in the study did not own farmland. Instead, they worked as labourers or undertook off-farm activities to earn income.

The farmland was important to grow food crops as a source of livelihood income and food for farmer households. As growing food crops was the main source of income and farmland was an important asset for smallholder farmers, they expended efforts to access or to own farmland. Some farmers leased land if they did not have farmland, while others sold some of their cattle in order to buy land.

The younger generation of farmers were granted land by their parents, either as an inheritance or a gift. Sometimes, the parents allowed their independent children to grow crops on their land.

"Y: you don't plant corn this year on your land?"

Mr. Fathul Rokhman: No, I don't. My son is growing corn there." (Mr. Fathul Rokhman, 152-153)

Some of the farmers in this case did not grow crops on their land. This was because they either did not have money to buy inputs, or they were focusing on other livelihood activities. Some of these farmers would allow their children to use the land to grow crops.

A social norm in the village was reflected in the way the independent children and their parents helped each other with crop farming activities. Parents offered their children access to land they were not using, as did the children for their parents when they needed access to farmland. This helped them generate additional profit so that they could improve their livelihoods. They provided labour on each farm (mutual assistance between parents and independent children), and this saved on labour costs. Although the parents or the children did not expect that they would receive the yield, those who were using the land shared some of the yield with the family who helped them.

According to the patriarchal norms in the village, sons inherited more assets than daughters. The assets commonly inherited were land for housing or farming, or livestock. For the adult women, especially the women-headed households, the land or other assets they had inherited often generated low income. Hence, they needed more effort to be able to increase their income. However, for the women-headed households, they might use their late husband's assets if they were widowed. For example, when Mrs Maya Sukma's parents passed away, she received a 2,500 m² land yard, while each of her brothers received a 3,750m² farm land. As she had already built a house with her late husband, she and her children lived in the house and used the inherited land for crop farming. She also had a 7,000 m² pawned land so that she could grow corn every year. This activity that was also combined with other activities (e.g. being a farm labourer on other people's farms) enabled her to earn enough income to fulfil the livelihood needs, and to provide her family with the opportunity to have savings, including cattle.

The role of livestock in shaping the decisions on managing cattle. Livestock was included in the mix of farmers' livelihoods assets in this case and livestock farming was an activity that shaped the whole livelihood systems. On the other hand, the mixed strategies also shaped the management of livestock.

In the past, farmers invested in cattle because they were affordable due to their low price. Farming a large number of cattle was not an issue for smallholder farmers because the sources of forage were available throughout the year within the villages. However, since the local government had promoted the corn development programme as its priority, most farmers adopted corn growing as one of their primary livelihood activities. This reduced the availability of forage because farmers could not release their cattle in the village to graze during the crop growing season. Farmers must put them in stalls or tie them up near their houses. Therefore, they must collect fodder to feed their cattle while at the same time they need to work to generate income for their daily needs. The sources of forage had also been reduced because land that was used to grow forage was then used for crop growing. The use of agri-chemicals in crop cultivation also made the forage poisonous to cattle. This had limited the number of cattle which farmers could rear. Accordingly, the smallholder farmers sold some of their cattle and invested the proceeds into other types of assets, such as land.

Farmers sold their cattle when they needed financial support for big expenses, such as for their children's higher education. Farmers also sold cattle for wedding celebrations in their households including the cost of dowry for the brides. In Sasak (the indigenous tribe in Lombok) tradition, the groom's family usually covers the wedding party on their side. The groom's family usually slaughtered some cattle for the party, and sold some others to cover the expenses.

People in the Transmigratory case also raised other kinds of livestock such as chickens, ducks and goats. They raised free range chicken and ducks on their yards to fulfill their daily needs. When they needed money, they sold livestock. The markets for chicken and ducks were potential and easily done as buyers from other villages came and bought them.

Other farmers often invested their money in buying goats when they still could not afford to buy cattle. Farmers raised goats because they grew fast, and a nanny or female goat could bear two kids each time. The length of each pregnancy was around five months. Farmers raised goats as a stepping stone to start raising cattle. When farmers

had many goats, they could sell them to buy cattle if there was not any event that required cash.

In terms of raising goats, farmers raised them the same way as raising cattle. Farmers tied their goats around their houses or put them in stalls during the food crop growing season where they were fed and watered regularly. They then released and grazed the goats in the dry season.

Some female farmers invested in gold when they had some extra money. They bought gold because they did not want to be holding their cash for a long time and were afraid of spending the money on unimportant expenses or frivolous items. Gold was a useful asset because it also could be worn for security purposes and it was readily sold anytime they needed and converted into cash. The smallholder farmers often did this to buy materials to repair their house, or to buy farm inputs such as fertilizers or pesticides. Some people had to buy gold because the income they earned was insufficient to buy goats or cattle.

“Basically, I am interested in it (investing in cattle), but my income is too low to buy [any cattle beast]. I need to provide IDR 3-4 million to buy at least one. Yet, with IDR 400 thousand, I could buy gold.” (Mrs Indah, Line368-371)

People could buy gold for less than IDR one million while they needed to have minimum IDR 3-4 million to buy a cattle beast. For smallholder farmers on low income, buying gold was the easiest way by which they could save assets. The small holder farmers stated that the gold price was stable and that they could easily re-sell it if they needed cash. For example, they could sell their gold at a local jewellery store or a pawnshop. On the other hand, some farmers kept gold for saving. They could convert the gold into cash very soon by selling or pawning when they needed cash. The availability of gold for saving, or for financial support for a productive income activity, or emergency, might help smallholder farmers to retain their cattle.

This study also found that formal and informal institutions shaped the use of the livelihood assets as well as the decisions on cattle. This is presented in the following section.

c. The role of formal and informal institutions in relation to smallholder farmers' decisions made about their cattle

This study identified that formal and informal institutions played out in smallholder farmers' livelihoods, which also shaped their decisions on their cattle. The institutional aspects which were identified include government assistance for crop farming that influence decisions on cattle, access to credits, and free health insurance.

Government assistance for crop farming that influence decisions on cattle. To cover farming costs, the farmers needed a high amount of money, and they often sold their cattle to cover it. The Government provided a range of grants or assistance to farmers, in this case, to support the production of crops such as corn and rice. These included grants for free fertilizer and corn threshing machines. The input granted to them could help smallholder farmers reduce their farming costs.

Unfortunately, farmers often received grants, such as free seed, after they had finished planting their corn. Thus, farmers believed that the grants were often ineffective because they were not provided at the appropriate time to be useful to them. They sold their cattle if they could not access formal or informal credits or did not have enough cash to buy the inputs. As the grants were provided at the wrong time, the farmers often sold the free inputs to other farmers rather than use them.

“Mr Darwan: This year, I received corn seeds only. Even, the grant came late. It came after a week we planted the corn.

Y: What did you do with the granted seeds?

Mr Darwan: I sold them to other farmers.” (Mr Darwan. Line 389-393)

The Government introduced several strategies to ensure farmers obtained good prices for their corn in the market. The expected price provided an opportunity for farmers to gain high income and to increase their savings (including buying cattle). The strategies were:

First, in 2016, the local government negotiated with the central government to obtain a minimum price for corn at the farm level. Second, the local government played a role in

stabilizing the corn price in the market. The local government bought corn from the farmers at a minimum price when private companies failed to offer a suitable price.

“We established a company to stabilise the corn price. The company bought [corn from farmers] if private companies did not buy from them ... The role of this company is to stabilise price when the local price falls.” (Mr Zuhri, Line 355-357)

Third, through their field officers, the Government regulated and monitored the transactions which occurred between private companies and farmers to ensure the dealings were fair. These companies often adjusted their measuring devices to underestimate the weight of a farmer’s corn crop. The field officers ensured that the scales were accurate.

“The role of big corn companies here is as corn yield collectors. The government monitors [transactions] regarding weighing up the yield. Sometimes, the companies weigh the corn up in the night and play with the scales. The price is high, but the weight is reduced.” (Mr Zuhri, Line 363-367)

Fourth, the Government provided moisture gauges so that farmers were more aware of the moisture content of their corn when they sold it to the middlemen. Field officers also checked the moisture content of farmers’ corn yield and this put farmers in a better position to negotiate a price for their crop because they knew the moisture content. However, the number of moisture gauges available to local farmers was limited so a lot of farmers did not have access to the tool. Despite this, local farmers stated that they were confident that they could estimate the moisture content of their corn based on experience.

“We have moisture gauges for corn yield at the farm level because the price is determined by the moisture.... We do not want buyers [cheated on farmers] by saying the corn is moist, but actually it is dry” (Mr Zuhri, line 377; 380-382).

Fifth, the local private company could accept farmers’ crops directly if they sold them 100-500 tons of corn. However, local farmers were not able to work together to sell their corn in bulk. This was because their crops were harvested at different times and

they needed to pay their labourers soon after harvest. Therefore, the local farmers had to sell their crops to middlemen who then on-sold it to the private companies. Hence, the farmers received a lower price for their corn than if they had sold it direct to the private companies.

“The harvesting schedules are different. Some harvest their corn this week and some others do it in the following weeks while farmers need to sell the yield soon because they need to pay the labourers.” (Mr Jayengrana. Line 390-393)

The other forms of institution that shaped the smallholder farmers’ livelihoods in this case were access to formal and informal credit facilities. This is described below.

The role of informal credits in shaping the decisions on cattle. In the Transmigratory case, most of the farmers preferred not to use informal credit. To avoid this, they had strategies such as earning cash to support their livelihoods without relying on informal creditors. They also used formal credit for their on-farm enterprises, particularly corn. However, some of the farmers used other strategies to gain financial support during the corn-growing season in the village. These were to build relationships with informal credit institutions such as local input suppliers and informal creditors (money lenders). These credits might also help smallholder farmers to retain their cattle because cattle might be sold when the farmers did not have other sources of cash sufficient to cover the cost of growing crops.

Local input suppliers provided inputs to the farmers that they could buy on credit or cash. This is considered an informal institution because, in this case, suppliers were not formal institutions. Moreover, the farmers and the suppliers did not have formal and written agreements on the loan. There was no interest for selling on the credit system. Yet, some farmers were not willing to delay payment when they had enough cash to pay the suppliers. That was the way the farmers maintained the trust between them and the suppliers. For the farmers who accessed the input supply by credit, they obtained the inputs they needed and paid the suppliers back after harvesting and selling the crops. Alternatively, the farmers could request that a local creditor bought the inputs they required for them and they were repaid along with interest on the loan once the crop was harvested and sold. Another source of informal credit was borrowing money from

helpful friends or relatives. The friends or family trusted that the farmer would repay the loan once the crop was harvested. In these instances, the smallholder farmers usually did not pay interest. The lenders stated that they were willing to lend trusted farmers money because they said they wanted to help others to overcome problems because they realised that helping each other was also beneficial for their family life (building mutual relationships). It meant that if people lent money to their family or relatives, they could get help in the future if they needed it.

Other than informal credit, smallholder farmers might have access to a formal credit facility. This is explained in the following section.

The role of formal credits in shaping the decisions on cattle. Farmers in the Transmigratory case had used the Credits for People's Business (*Kredit Usaha Rakyat* or KUR) programme since around 2010 when the Dompu Government introduced the corn flagship programme. The farmers in this village were offered the credit facilities much earlier than farmers in other areas because Kampasi Meci was one of the pioneer villages for the corn-planting programme in Dompu. The KUR programme was set up to support the farmers who were adopting corn production.

Initially, the KUR was distributed to the farmers through farmer groups. Later, the Bank for Indonesian Citizens (*Bank Rakyat Indonesia* or BRI) offered the credit service to farmers individually because the Bank trusted the farmers who could repay the loan in a timely fashion. The local farmers believed that the KUR was helpful for crop farming, because it required a lot of inputs, particularly hired labour. More recently, the farmers had used the KUR to support, not only corn farming, but also cattle farming.

"Mr Afandi: for crop farming purposes, [farmers] can get IDR 10 million while for cattle farming the bank can give up to IDR 25 million.

Y: How long does the bank give you the loan?

Mr Afandi: Both [loans for crops and cattle] are the same. A year each kind of loan... If you pay it (the loan) after a year, you pay a little bit more than IDR 11 million, but if you pay less than a year, you pay less than that. I paid [the loan] IDR 10, 825,000 for crops last year." (Mr Afandi, Line 325-336)

Farmers could borrow up to IDR 25 million for a year for cattle farming which the same amount is provided for corn farming. However, farmers often obtained a loan for cattle farming near the beginning of the corn-growing season, but used the money to finance the planting of their corn crop instead of using it to buy cattle. The credits might help farmers to retain their cattle. Moreover, the farmers could buy cattle after they covered the cost of growing corn or after receiving payment from selling corn.

To obtain credit from the bank (BRI) to buy cattle, farmers needed to meet certain requirements – they must own cattle and they must be citizens of Indonesia. To demonstrate that they owned cattle the farmers were required to provide their cattle cards, thus they needed to be aware of the importance of having a cattle card. To demonstrate that they are a citizen, the farmers' must also provide their citizenship ID cards. In reality, many cattle owners did not have cattle cards and were not aware of the importance of having these cards. They were more familiar with the credits for cropping. In relation to cattle, these credits offered a higher amount of cash than informal credits with low interest so that the crop farmers could potentially gain higher income. Therefore, this might also increase the opportunity to buy cattle. For some other farmers, they could also access other types of credits. In terms of location, a pawn shop was relatively easy to access as it was located near the village.

A pawn shop was an important facility for the villagers in this situation. The pawn service called *Pegadaian*¹¹ had been established in all the sub-districts across Indonesia. The services provided are various, not only for pawning but also for saving or buying gold. People who had particular assets (gold, land, vehicles, and so on) could make a pawn transaction in this institution (www.pegadaian.co.id). This was helpful for many people who did not have many assets to get cash whenever they needed. The amount of money could be received from the pawn shops was usually smaller than the price of cattle. Yet, the pawn shop could support the smallholder farmers when they needed cash. This could also help them retain their cattle. If the smallholder farmers did not have assets to become their collateral, they could access informal credits.

¹¹ The most common pawn service in Indonesia is "*Pegadaian*", which is a private institution in Indonesia, established in 1746.

This study also found that the institutions that shaped smallholders' decision to retain cattle were also related to non-income activities. Free health insurance is an example of this finding.

Free health insurance: how this supports the livelihoods of farmers in the Transmigratory case? A free healthcare insurance programme was provided by the local government for people of Dompu (*Jaminan Kesehatan Masyarakat Dompu*, JAKKAD). This programme is a form of formal institution which was viewed as useful by the people as they did not have to find cash to pay for the cost of healthcare. When the family members of the farmer households were sick or injured, they even sold their cattle to pay for the healthcare, especially if the family members had to receive intensive care such as hospital or regular treatments. However, the programme sometimes had problems. An application for the JAKKAD to be processed was time-consuming and farmers often had to pay for the cost of the healthcare before the insurance was paid out. When it happened, the families in this case needed to pay for another health insurance programme which was more expensive. In this case, the programme was mainly used by well-off families because these farmers understood that they could obtain better services and treatment in larger hospitals outside of Dompu if required. Therefore, health insurance helped people to keep their cattle from being sold.

d. Crop farming-related activities that shape smallholder farmers' decisions on their cattle

This study found that food crop farming was the main source of income for the majority of farmers in this case. The decisions on cattle were shaped by how these crop-farming activities could help smallholder farmers to sustain their livelihoods. This section describes the smallholder farmers' management of their food crops. The major food crops that the smallholder farmers cultivated in this area included corn and rice.

Corn farming activity in shaping the decisions on cattle. Before corn development became the Government flagship programme, farmers mostly relied on rice as a staple crop. On their dryland, farmers planted the rice varieties that were suitable for these conditions. The local government then introduced corn as a flagship programme and, as a result, corn started to dominate the farming systems in the Transmigratory area.

Importantly, the corn programme was initiated in the case study's sub-district. Farmers rapidly adopted corn because of the level of support the local government provided for this crop. Farmers soon learnt that corn was more profitable than growing other types of crops. The land in this area was rain-fed and well suited to growing corn. As a result of these factors, corn began to dominate the farming systems in the area.

As Government support, for growing corn, farmers received free seed, and subsidized fertilisers. The farmers could buy these inputs from official suppliers who were appointed by the Government. The suppliers received a list of the members of farmer groups in the area, and the farmers who registered in a farmer group were entitled to obtain these subsidised inputs. However, there were several farmers in the case study who did not join farmer groups. They did not receive the subsidized inputs because their names were not recorded in the Agriculture Department's database as the owners of the land. The farmers¹² used their own money to buy inputs or borrowed cash from others to do so. The farmers also sold their cattle if they did not have cash or could not access credits.

The crop farmers cultivated corn to generate cash, and the entire yield was sold soon after it was harvested. Corn provided farmers with a reasonable amount of income. Although it required a large outlay on inputs to grow, the gross income from growing corn was also high and this motivated farmers to grow corn. “.. *The good thing here is that the corn price has never fallen....*” (Mr Afandi, Line 164-167). When the farmers considered the price of a commodity was “never fallen” means that the farmers could always gain profit although it was slightly lower than expected. If the corn failed (e.g. because of crop failure) while they needed to pay a loan, the smallholder farmers usually sold their cattle if the available cash could not fulfil the need to pay the loan.

For rice, farmers stored their rice yield for their daily consumption as well as for an emergency. They could consume the rice, or sell some of it when the smallholder farmers needed petty cash to buy small but urgent expenses. For example, some people

¹² The farmers here referred to crop farmers, and it was common among the community in this case that crop farmers also raised cattle.

sold two kilograms of rice to buy cooking oil when the people did not have cash to buy the oil.

Rice farming activity in shaping the decisions on cattle. Some land was not suitable for growing corn because it was too wet in the rainy season so the farmers used this land for rice. The area for growing rice was smaller than the area for growing corn. “...two hectares for (growing) corn and 25 are¹³ for (growing) rice.... ” (Mr Jayengrana, Line 25). Farmers needed to plant rice because it was their staple food, and people felt secure if they could produce sufficient rice to feed their family for the next 12 months. Rice also required limited labour because the area grown in rice was relatively small. Some farmers used family labour to reduce the labour cost of farming. The rice yield was stored and then used to fulfil their daily consumption needs. The daily food security is important for the smallholder farmers’ households because fulfilling basic consumption was their priority. The security enabled farmers to retain their cattle. Other than growing corn and rice, the smallholder farmers also grew several other types of crops. Although those were not the prioritised crops, the farmers could grow them as alternative income.

Growing other crop activities in shaping the decisions on cattle. After the rice or corn was harvested, the local farmers could still plant other kinds of crops during the dry season such as mung beans, peanuts or soybeans because these crops did not require much water. There was sufficient water available during the dry season to support the growth of these crops after the main food crops had been harvested. Growing these crops might become the added income in smallholder farmer livelihoods. If the smallholder farmers could fulfil their daily needs from these small income sources as well as stored rice, their consumption need was secured. This situation provided an opportunity to increase their savings. The farmers could invest in more cattle if they could accumulate their smaller savings.

In the dry season, the farmers must buy inputs themselves because inputs crops other than corn and rice were not subsidized by the Government. Farmers used the income

¹³ 1 are = 100m².

from the sale of corn and sometimes rice (some farmers in this study sold rice only if necessary), or from their labouring jobs to finance the production of the crops in the dry season. However, these crops required minimal inputs, and the main cost was the labour cost. After harvesting the dry season crops, the farmers sold most of it, and stored some for household consumption. The income from growing mung beans, peanuts or soybeans could support their livelihoods during the dry season when there were not many income-generating activities available in the village.

The tree, Sesbania or *Sesbania grandiflora*¹⁴ grew the whole year round in the village so it was available for people's consumption every day. This plant was a widespread complementary food for the farmers. Farmers planted Sesbania on their farms and it was also used for cattle or goat forage. Some planted the trees as the fence around their houses.

Cashew nuts used to be the primary agricultural commodity in Dompu in 1990s-2000s. In 2002, Dompu was one of the main source areas of cashew production in NTB province (Pearson et. al. 2005). Since then, farmers have replaced cashew nuts with corn because they found that corn was more profitable and the Government provided a lot more support for this commodity. Since then, cashew nut production in the area has become quite limited. However, some farmers were still growing cashew nut trees as an additional source of income because the demand for this commodity was high and the price was also relatively high for the farmers.

"A: I do not want to cut my cashew trees because when I am not planting crops, I do not have any income-generating activities other than raising cattle. Cashew nut is the income in the dry season.

Q: Do you earn income from the cashew nut?

A: Yes, I do. I can sell 10-20 kgs per season. The price is various. It is between IDR 7,000-20,000 per kg." (Mrs Gunawan, Line 242-250).

¹⁴ *Sesbania grandiflora* is an indigenous plant from South East Asia. It has long green leaves with paired leaves. It also has white, pink or red flowers. People in Indonesia, such as in Lombok, consume the leaves or the flowers as a vegetable (Source: Wikipedia).

Several farmers, such as Mr and Mrs Gunawan, did not plant corn because they did not have sufficient financial support to plant corn at the time of the interview. Mr and Mrs Gunawan did not earn much income from other livelihood activities. They actually could obtain inputs from suppliers and delayed the payment until they could sell the crop yield. However, they did not have sufficient funds to pay for labourers. Rather, they continued to grow cashew nut trees, which were harvested during the dry season and sold to cashew nut buyers. For other smallholder farmers in the same situation as Mr and Mrs Gunawan, the cashew nut provided income for their daily needs.

When the smallholder farmers did not grow corn and rice, they could rely on these other crops for their own consumption, or to sell them. The mixed crops and activities could help smallholders to sustain their livelihoods and to prevent them selling their cattle.

Farm labour was an alternative source of income which was common among the smallholder farmers. The following presents how this shapes decisions about their cattle.

Working as farm labour as another alternative income activity. Working as farm labour was another alternative income activity that was mostly available during the wet season or during the crop-growing season. Men and women earned additional income from labouring on a daily basis on food crop farms. Employment was available most of the year, except during the dry season. The demand for on-farm labouring jobs was at the peak during the corn-growing season at the beginning of the wet season. This income activity might help in securing their daily consumption and could even save some of their earnings. They could increase their savings by investing in small livestock or even buying cattle when they could accumulate their savings.

As many farmers grew corn at the same time, the people who relied on being labourers had work almost every day, and they could cover the cost of their daily needs. The crop farmers also worked as labourers to obtain wages to help pay for the costs of growing corn on their own farms. Thus, they could enhance the opportunity to retain their cattle rather than being sold to cover the cost of crop farming.

Raising daily income from the on-farm labour work was important for women-headed households where the women did not have many skills and limited farmland, and relied on labouring income activities to support their families. This money could also be used to finance inputs for crop growing on their own land or it could be put into savings by buying gold, small livestock or funding the operation of a small shop. Saving farming costs might increase the farmers' profit from crop farming. This means that they could increase the opportunity to retain or buy cattle.

In agriculture-related activities, smallholder farmers also invested in cattle and other kinds of animals to support the income activities that have been described above. The section below explains how livestock plays out in the smallholders' livelihoods in this case.

e. Non-agricultural types of income activities in shaping management of cattle

Earning income from non-agricultural activities were also alternative livelihood activities of smallholder farmers to sustain their livelihoods. An alternative strategy was to invest the surplus income in a small retail opportunity such as a small shop, or brick-making. They could earn income especially when the income activities in agriculture were not available. These combinations might help sustainability in smallholder farmer livelihoods and provided more opportunity to retain cattle. The following sections describe these different strategies that smallholder farmers used to fund their day-to-day cash requirements.

Brick-making and the relationship with the decisions on cattle. Some smallholder farmers chose to make bricks on their land for the whole year as an alternative way to earn some money when they did not work on their farms. The income from this industry depended on the location of the farm. Road access was an important factor which supported brick marketing. Buyers usually came to the location of the brick maker in their own vehicle and bought the bricks on location. Accordingly, road access was important for brick-makers. Consequently, brick-makers whose locations were far from a main road usually earned less than someone who was on a main road.

“My location of brick-making is far from the main roads, while there are many other brick-making [industries] along the main roads. Therefore, there are not many consumers who come to my place.” (Mrs Fathul Rokhman, Line 109-112)

Some farmers preferred to make bricks in the dry season when there are not many on-farm jobs, or when they do not have enough financial capital to plant crops. This industry is used to help some smallholder farmers to earn income to support their daily lives. Making bricks does not require a large investment because most of the required resources can be found on their landholding. They only need soil, materials to bake the bricks, a tarpaulin to protect the bricks from rain, brick-moulding tools, scoops, hoes, and a wheelbarrow.

Investment in small retail outlets and the relationship with the decisions on cattle. Some women preferred to run a small retail outlet and use this to generate cash for their day-to-day requirements. This activity could be run by the farmers while they kept their cattle. For the women-headed households who had cattle, they did not raise too many cattle, while they could raise income from running this retail.

Normally, the farmers set up a table on their veranda and provided snacks, coffee, and cigarettes. Sometimes they also sold other consumables such as detergents, rice, sugar, and so on. They purchased small amounts of product to sell in their shop because they had limited financial capital. The small retail outlet allowed women to generate cash for their daily living expenses when they were not working on the farm. It was important to women because they had fewer opportunities for generating income compared to men.

Working abroad or migrating to other regions in Indonesia. Many of the younger generation in the Transmigratory case migrated to either other places in Indonesia such as Sulawesi or Kalimantan Islands, or overseas to Malaysia or Saudi Arabia for remittance. They chose this option because they could earn more income than if they stayed at home and worked as a farmer in the village. Becoming a migrant worker improved their livelihoods and they could save money to build a house or buy some land or cattle. Cattle were often sold by the households to help with transportation and accommodation costs for migrating family members.

On the other hand, not all migrant workers were successful. For some cases, those who worked abroad faced a number of problems such as having to repay debt to the company that set them up with the job, or to pay their healthcare when they got sick. These problems meant that they could not save and transfer money to their family in the village. As a consequence of this, these workers often returned home.

Grocery and food vendors. Young men and women in the Transmigratory case had identified other livelihood activities which they could adopt to obtain a better livelihood than farming, for example, becoming a food vendor (e.g. *bakso*¹⁵ vendors), or a grocery vendor. The vendors usually did not earn income from farming crops but they invested in cattle through shared farming with other people who were willing to keep cattle. Yet, for some other people in this case, they were not interested in investing in cattle, but preferred to save in banks where they earned a profit.

To be a grocery or food vendor, an individual needed a motorcycle, a basket that could be attached to the motorcycle to carry their produce and, if cooking produce, some form of cooking device, and sufficient money to buy inputs and cover their operational costs. A new vendor usually obtained a loan from friends or relatives, or sold some assets to in order to set up the business.

The vendors usually worked in a group, helped each other and divided up the district in terms of who would sell in what area from a marketing perspective. There was no competition between vendors as demand far outstripped supply and there were multiple opportunities for new vendors to start up a business.

The operational costs for grocery or food vendors were fuel and money to buy produce. The vendors would calculate how much profit they received per day and then allocated that profit to pay for the operational needs of their households and any surplus went into savings.

"I can gain up to IDR 150 thousand per day. I save IDR 100 thousand, and IDR 50 thousand for daily needs." (Ms Ginara, line 277-278)

¹⁵ *Bakso* is a meatball made from beef and is very popular in Dompu.

Bakso vendors mostly used a motorcycle to reach their customers. They designed their vehicle and equipment themselves based on observing the set-up used by existing vendors. The basic equipment for selling *bakso* included a motorcycle or a car, a cart, a steamer, a set of gas stoves, and soup utensils.

The *bakso* vendors sourced their meat from local butchers on a daily basis. As the vendors became regular customers, trust was built between the butchers and the vendors. The butchers then allowed the vendors to delay the payment for their meat purchase until their next purchase, after they had sold all the *bakso produced from the first purchase*.

The income from selling *bakso* enabled the vendors to save a certain amount of money each day. For instance, some vendors could save IDR 200,000-300,000 (USD 20-30) per day excluding the operational costs and money required for their daily needs. This level of profit had inspired other people to adopt this business.

In their daily life, the grocery and *bakso* vendors usually focused their efforts on their vendor business. As such, they tended to specialise and did not have other livelihood activities such as undertaking farm work. They did not have time to look after cattle or to grow crops. They were more focused on enhancing their business through the sale of groceries or *bakso*.

6.2.2. *The roles of smallholder farmer livelihoods in influencing their decisions in relation to cattle management practices*

In the previous sections, the livelihood activities of the smallholder farmers in the case study were described to provide a context from which to understand how they managed their cattle enterprise. In terms of cattle production and marketing, there were several factors that shaped their management. These included food crop farming, forage availability, and institutions (i.e. informal institutions such as social norms, and formal institutions such as development interventions). Another aspect that shaped smallholder farmers' management of cattle was farmers' responses to cattle development initiatives, and the marketing system that exists in the case study area.

a. The roles of food crop farming, forage availability, and institutions in shaping smallholder farmers' decisions on cattle farming

Forage scarcity was the main problem facing smallholder farmers when raising cattle in the village. During the wet season when most farmers grew food crops, farmers raised cattle in stalls or tied them up close to their houses so that they did not damage the corn crops growing in the village. This meant that the farmers had to spend time collecting forage on a daily basis to feed their cattle in the wet season when they were busy with their main food crops (corn and rice). Further, the increase in corn farming in the area had reduced forage availability because land that previously grew forage was now in corn. The chemicals used in corn farming also made some of the forages that grow near the corn crops toxic to cattle, further limiting forage availability in the village. With the increase in corn farming, farmers needed to travel further away from their village to collect forage. Alternatively, they could purchase it from other farmers, but it was expensive. For example, in 2017, farmers bought grass for IDR 10,000 (1 NZD = IDR 9,000) per rice bag from people who collected it outside of the village. The lack of forage and the need to spend valuable time collecting it limited the number of cattle farmers could raise and this was normally less than ten.

In this case, several factors influenced the farmers' decisions in relation to cattle feeding and the number of cattle they farmed (Figure 6.1.). Formal institutions had impacted on these decisions indirectly. For example, the regional corn policy resulted in farmers adopting corn production over the wet season. With the increase in corn production in the village, farmers had to change the grazing management of their cattle. Rather than allowing their cattle to graze freely in the village, they now had to tie them up or place them in stalls. This was a social norm that had emerged as a result of the increase in corn farming. Failure by a farmer to control his cattle during the wet season could result in sanctions against him. To feed the cattle, the farmers must gather forage, but the increase in corn farming reduced the availability of forage within the village over the wet season. This reduced the land area on which forage could be grown and chemicals from corn growing also made the forage that grew near the corn crops toxic to cattle. Corn farming also placed a greater requirement for labour on the farmers, so they had limited time to collect forage for their cattle. These two factors influenced

farmers' decisions about the number of cattle they farmed. The vulnerability context also influenced these decisions because seasonality was an issue in the village with corn only being able to be grown in the wet season. On the other hand, during the dry season, farmers in this case could graze their cattle on any land in the village. This was because they could not plant crops in the dry season due to the lack of rainfall. Therefore, during the dry season, the farmers had plenty of time to look after their cattle. The farmers usually stored dried bean crops such as mung bean or soybean which were produced during the wet season to feed cattle. Farmers would also travel to other villages to collect crop residue for fodder.

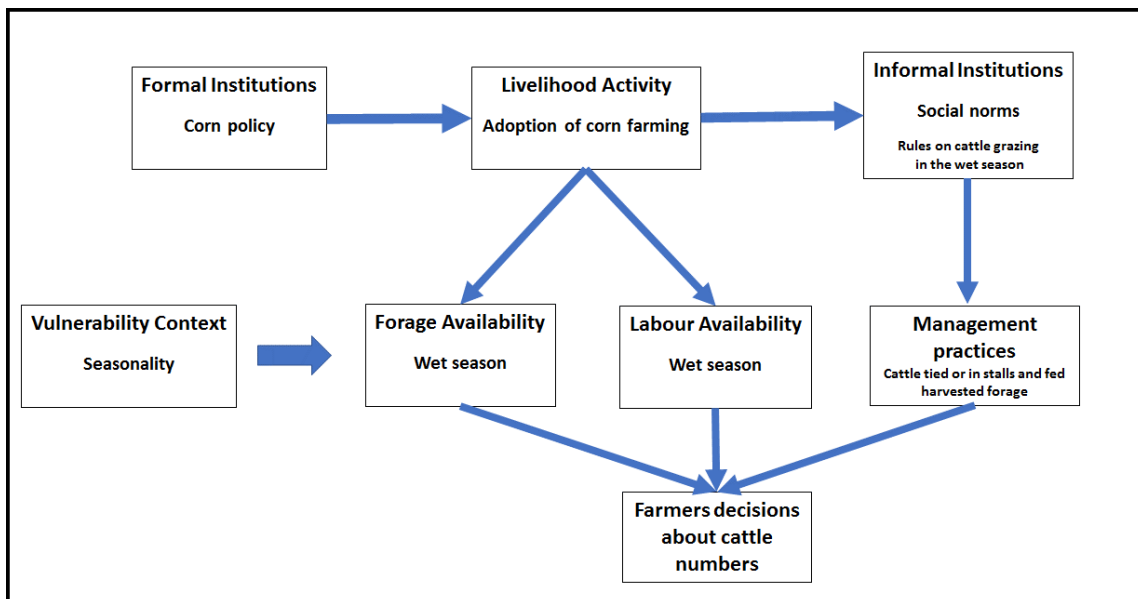


Figure 6. 1. How livelihoods influence farmers' decisions in relation to cattle management and numbers

Farmers believed that raising cattle was profitable, because the value of the cattle could be increased. There was a common practice among the farmers in this study where they preferred to increase the value of cattle through breeding rather than fattening (informal institution). That was because farmers could gain a calf per year. Fattening and selling fattened cattle for regular income was not a common practice among farmers in this case. Although the farmers limited the number of their cattle, they

preferred breeding to fattening. That was because the function of cattle was for insurance saving, meaning that farmers sold cattle when they needed cash urgently.

People who intended to own cattle, but could not afford to buy them financially, usually started from raising others' cattle; that was called *kadas*. In this practice, two parties (owners and keepers or *pengkadas*) make an agreement of 1:1 shares (informal institution). For example, the first-born calf belonged to the owners and the next calf belonged to *pengkadas*. This system has enabled some farmers who became *pengkadas* to own cattle without having to buy them. When the number of cattle owned by keepers increased, they could sell some of their cattle and bought land for crop farming.

This study also identified the Government development initiatives to support cattle production in this case. How the Government initiatives shaped smallholder farmers' decisions on their cattle is presented in the section below.

b. Farmers' responses to cattle development initiatives in shaping smallholder farmers' decisions in farming practices

The Government used a number of formal institutions in an attempt to influence farmer behaviour. These formal institutions comprise Government interventions or cattle development initiatives. Social norms shaped farmers' access to, and use of, the services provided for cattle as a consequence of the Government's development initiatives. The services the Government provided included cattle grants, cattle vaccinations, cattle cards or certificates, and artificial insemination. The social norms that influenced farmers' access to and use of these services included those in relation to gender farming practices. The following sections describe the Government services provided to cattle farmers, how farmers responded to these services and the factors that shaped these responses.

Smallholder farmers' response to cattle grants. The Government implemented various programmes to assist cattle farmers to improve cattle production and productivity in the Dompu regency. The assistance was distributed through farmer groups. To obtain these grants, most farmers formed cattle farmer groups which lasted for the duration of the programme. There were also existing farmer groups and these

groups also accessed the grants. However, although there were men and women farmers in the groups, the grant proposals were only developed for male members. This is an example of gender norms limiting women's access to grants. At the end of the programme, the cattle were either sold or retained by the farmers.

Importantly, the farmers did not use the cattle grants in the manner the Government expected. The farmers were expected to manage the cattle they purchased with the grants in their farmer groups. They were expected to work together and learn about how to effectively manage cattle farming systems. The Government introduced a revolving system, where half of the farmer members received grants to raise bulls and cows from the Government. After a year these farmers kept the calves, and passed the cows on to the other half of the farmer group. However, the farmers considered that using the revolving system took too long to obtain the cattle grant. Therefore, they changed the mechanism for distributing the cattle grants, which breached the rules set up by the Government. Instead of using a revolving system, they gave each farmer a smaller grant so that everyone in the group could buy cattle. There were also other problems because some farmers used the cattle for consumption needs and other groups sold all of the cattle and divided the money among the members.

The Government expected the farmers to retain the cattle they purchased with the grants and, as a consequence, increase beef production in the region. However, the farmers did not distinguish between the "granted" cattle and their own cattle. When they needed a large sum of money to either pay for inputs or labour for growing corn, or for a wedding, they would sell some cattle and often this included the granted cattle. They would also sell the granted cattle if the number of cattle exceeded the limit of the capacity to keep cattle.

"For example, when our kids get married and when we look at our [economic] ability, we can throw the parties in one day. However, we push ourselves [to do more than a day] so that people will consider us a great [family]. We show off and we rent stuff. Finally, we sell cattle to cover them all." (Mr Sukma Arga, Line 683-686)

An important local social norm is that families arranged a large wedding party for their children because this gave them status and it was expected by the people of the village. They invited all the people from the village and slaughtered some of their cattle to feed their guests. They also had to sell some of their cattle to fund the wedding. If the smallholder farmers did not have too many cattle, they could slaughter or sell the cattle which were granted to them from a cattle development programme.

In reality, not many farmers in this case received cattle grants because their availability was limited. The cattle grants could be accessed by the farmers who were the members of a livestock group¹⁶, while being the member of the group was not easy, especially for women. This is explained further below.

The influence of gender norms in shaping access to development initiatives on cattle. In the Transmigratory case, women became head of a household (WHH) because they were divorced, their husbands had passed away, or were overseas working. However, the prevailing sociocultural norms of this patriarchal society limited women's access to public affairs. This limited their opportunities to access the Government development initiatives in the village.

Women's lives changed when they were separated from their husbands. Some women went back to their parents' house after they were divorced. These women were either supported by their parents for their livelihoods or, alternatively, they were given land and/or a house so that they could live independently. Women who had either lost their husband or their husband had gone overseas to work, continued to live on their farm independently. The men who worked overseas mainly worked in Malaysia on palm oil plantations. The women of these men managed the income sent back by their husbands and also generated income of their own to support their daily needs. The husbands transferred money to their wives a number of times per year depending upon their

¹⁶ The members of the crop farmers were recorded in the Agriculture Department, while the members of the livestock farmer groups were recorded in the Livestock Department. The rules of joining the groups were different in each institution. The membership of the crop farmer groups were recruited and recorded based on the ownership or the use of a farmland. The information about the membership was input by the field officer of the Agricultural Department. On the other hand, the livestock farmer group members were formed by farmers independently. They were usually formed to apply for a project (e.g. to apply a cattle grant programme).

working conditions. The women normally needed to generate income between these instalments from their husbands.

The decision to invest in cattle for some households was related to the local tradition in the village in relation to wedding ceremonies. Families needed to save money for their sons' weddings in the future. Based on local norms and traditions, when a man was getting married, he must provide a dowry for his wife. The parents must also arrange a wedding party. The man's family needed to provide money to meet these social obligations.

Many WHHs in this case study raised cattle to support their livelihoods. Some of them who could not afford to buy cattle chose the *kadas* (shared-farming) arrangement so that they could begin to invest in cattle. The number of cattle being kept also depended on the capability of their labour. In raising cattle, WHHs used family labour to look after the cattle. The mothers trained their children to take responsibility for raising the cattle so that they could do other livelihood activities. When the children came home from school, they collected fodder, or grazed the herd. The children undertook this willingly because they knew that the cattle would be useful in helping fund their future study, marriage and other livelihood activities.

There was an issue in relation to gender roles in the village. First, women-headed households often did not have many choices to access forage, especially during the wet season, when the farmland in the village was covered with food crops. As their cattle were tightened around their house, they had to collect fodder. They even needed to travel far away from home to collect forage because the availability of forage was low as other farmers in the village also collected fodder in the village. The women could not collect too much forage because they had to stay close to their house and look after their family (providing food or doing other household chores). They could access more forage if they had money to buy it from other people who travelled outside of the village to collect forage. Otherwise, if they had adult sons, they could travel to collect fodder too. The limited mobilisation of the women to collect fodder and labour shaped the women-headed households to have lower number of cattle than men-headed households. If the

number of cattle they had exceeded the capacity of keeping cattle (labour and forage available), they sold some of their cattle to keep the number manageable.

The second issue related to gender was that many women relied on cattle for their livelihoods and used Government services for their cattle (See the following quote). However, many of the women, especially WHHs, did not have access to cattle farmer groups and were not invited to join such groups. As they were not members of a farmer group, WHHs did not receive information about programmes related to cattle development such as cattle grants or forage innovations. Similarly, because the WHHs did not belong to a livestock farmer group, they did not receive any cattle grants.

On the other hand, the women in this case could access the Government's services for their cattle. They were aware of the importance of using the vet services for their cattle and willing to pay for the services such as AI or healthcare.

"Mrs Dita Pujiani: I always call the vet officer when I have problems with the cattle's health because I always care about the cattle health. If I found my cattle were sick then I called the vets as soon I found them sick.

Y: How much did you pay?

Mrs Dita Pujiani: I pay IDR 25 thousand for each shot. Once, the vet gave three shots for my cattle and I paid IDR 75 thousand.

Y: Why are you willing to pay?

Mrs Dita Pujiani: [Because] I was grateful for their services.

Y: Are the services important for you?

Mrs Dita Pujiani: Yes, they are, because the cattle health is very important. I don't mind paying the services as long as the cattle are always healthy.

Y: How did you know the vet officers?

Mrs Dita Pujiani: They are always around this village to provide the AI services because the bulls are very limited in this village. So, the officers came to the village regularly to give the AI services. I got their numbers from my friends." (Mrs Dita Pujiani, Line 726-744)

In terms of other development initiatives such as healthcare and administration for cattle, the following section describes how smallholder farmers' decisions were shaped by those factors.

Smallholder farmers' decisions on cattle healthcare in response to the government initiatives. Farmers' responses to government services such as the provision of vaccinations, cattle card-making, and artificial insemination (AI) in the Transmigratory case were influenced by several factors, including the sociocultural norms associated with cattle farming and farmers' awareness of the benefits of the services. The normal practice for farmers was to keep their cattle in the village for the whole year. Safety or risk management was the main reason why the farmers in the Transmigratory case kept their cattle in stalls near their houses rather than sending them to the grazing land. This prevented the cattle from being stolen, getting lost or dying from misadventure.

Many of the farmers in this case viewed cattle healthcare and artificial insemination as important because they wanted to obtain good performance from their cattle. However, most of the farmers did not consider cattle cards or certificates as being important. The farmers thought that cattle cards were only important as proof of ownership when their cattle were sent to grazing land or sent out of Dompou for marketing. However, because they did not send their cattle to grazing land, the cattle cards were not seen as important. Similarly, the farmers relied on the cattle buyers to obtain cattle cards for their cattle when they sold them.

Cattle buyers tended to assume that farmers did not have cattle cards because obtaining these was quite a complicated process. Farmers also made this point. They also stated that when they sold cattle, it was normal to access funds quickly because they needed money. Obtaining a cattle card took a long time and was not conducive to them obtaining cash quickly. Accordingly, rather than obtain cattle cards for their cattle when they sold them, farmers accepted a lower price for their cattle and had the cattle trader or middleman obtain the cattle card for them. The middleman organised the cattle cards and paid the cattle card fees and then deducted their costs for this service off the price of the cattle.

“...not having cattle cards is very common here. [This kind of transaction] is easier for farmers because the process of making cards is complicated and the time the transaction takes will be longer. It’s better for the buyers to apply for it. It’s easier.” (Mr Fathul Rokhman, line 657-664)

If farmers did not obtain cattle cards, it was also assumed that they did not vaccinate their cattle because vaccination and cattle card-making were done simultaneously. Cattle card-making was a government programme which was implemented once a year. Farmers gathered at an approved place with their cattle. The government field officers vaccinated cattle and provided the farmers with cattle cards. However, most farmers were not aware of the importance of these activities. The farmers in this study admitted that they did not attend the group vaccination process run by the Government. The vaccination programme was implemented during the dry season when the cattle were released around the village and farmers were busy undertaking other livelihood activities and sourcing forage for their cattle. Thus, they did not have time to attend the vaccination programme.

Although the farmers did not understand the importance of vaccinations, they were concerned about the health of their cattle because their cattle were their primary form of savings. The farmers used health care services from the Government when their cattle had health problems. They called the vet paramedics and paid for their services. The paramedics do not set a fixed cost for their services; rather they accepted whatever the farmers could pay them on the day. The farmers understood that the paramedics should be paid in appreciation for the services they provided. Farmers normally paid around IDR 25-50 thousand per visit, depending on how much money they had. Sometimes farmers rewarded the paramedics with goods such as chickens. However, if the farmers did not have money, they used a traditional healer to cure their cattle health problems. Some diseases could be healed by a traditional healer, but some could not. When the cattle could not be cured, farmers slaughtered them and sold the meat to the villagers at a low price.

Farmers used AI when they had money to use the service. AI was the preferred option because farmers could obtain better quality calves from using this technology. They

could also choose preferable breeds, and cattle buyers from outside the Island preferred these breeds. However, these buyers only visited the village infrequently, so they could not be relied upon if a farmer was selling cattle. Moreover, farmers often lacked access to a breeding bull because they tended to sell male cattle whenever they needed money. Often this occurred when the bulls were quite small. Farmers preferred to retain their female cattle because they would increase the number of cattle they owned through breeding.

Although many of the farmers used AI, it was not always successful and farmers had to pay for several services to get their cows pregnant. The farmers paid IDR 50 thousand per insemination and IDR 250 thousand when the AI was successful and the cow produced a calf. If the farmers did not have money to pay for the inseminations, they preferred to use a local bull and they paid the owner of the bull a service fee. They paid IDR 50 thousand which covered a number of services until the cows were pregnant. However, bulls were not always available, and farmers did not always have money available when their cows needed to be mated. The other problem with the AI service was that the market for imported breeds was limited. Local buyers preferred to buy the smaller cattle from the local breeds rather than the larger cattle produced by the imported breeds. This was because the price was cheaper and the smaller cuts were easier to market. In contrast, the imported breeds were sought after by buyers from outside of the Island such as from Sulawesi.

Smallholder farmers' decisions about cattle included making choices whether to sell or to retain their cattle. The section below provides explanations around cattle marketing chains, supply and demand, and cattle pricing in shaping smallholder farmers' decisions on cattle.

c. The nature of cattle markets in shaping smallholder farmers' decisions on cattle

This study identified that markets and social norms shaped the smallholder farmers' management of cattle in this case. This section describes the cattle marketing chain, relevant social norms, and cattle pricing system and how these factors influence the cattle marketing decisions of the farmers in the case study.

How cattle market shapes smallholder farmers' decisions on their cattle.

According to the actors interviewed in the Transmigratory case, the cattle price did not fluctuate over the whole year. Although demand for cattle increased during the Eid seasons, it did not significantly increase the cattle price at the farm level. The standard price was based on the physical appearance so that the agreed price between farmers and buyers was based on the bargaining skill between the parties. They learnt about predicting price based on the physical appearance from their fellow farmers in the village, especially those who focused on cattle trading. Only a few larger farmers focused on cattle fattening and cattle trading.

Farmers had opportunities to gain regular income from cattle farming because there was a high level of demand for cattle in Dompu. Buyers were actively looking for cattle in the villages to meet their market requirements and this was particularly so for buyers from outside the Island. These buyers knew that cattle price in Sumbawa Island, including in Dompu, was cheap, so this was from where they preferred to buy their cattle. There was a market for sick or injured cattle because butchers preferred to buy these cattle as they could pay a low price for such cattle. Although farmers realised that there was high demand for cattle, they did not take advantage of this market opportunity by moving into cattle finishing as a source of regular income. This is because in this community there is a social norm that cattle are viewed as a form of savings or insurance, rather than a regular income-generating activity. Farmers focussed on crop farming and their other businesses to generate the cash flow for their livelihoods.

In cattle and beef marketing, the market chain actors involved farmers, middlemen or "*penendak*", *inter-island* buyers, brokers or "*tukang catut*", slaughter houses, local butchers, and bakso vendors (Figure 6.2).

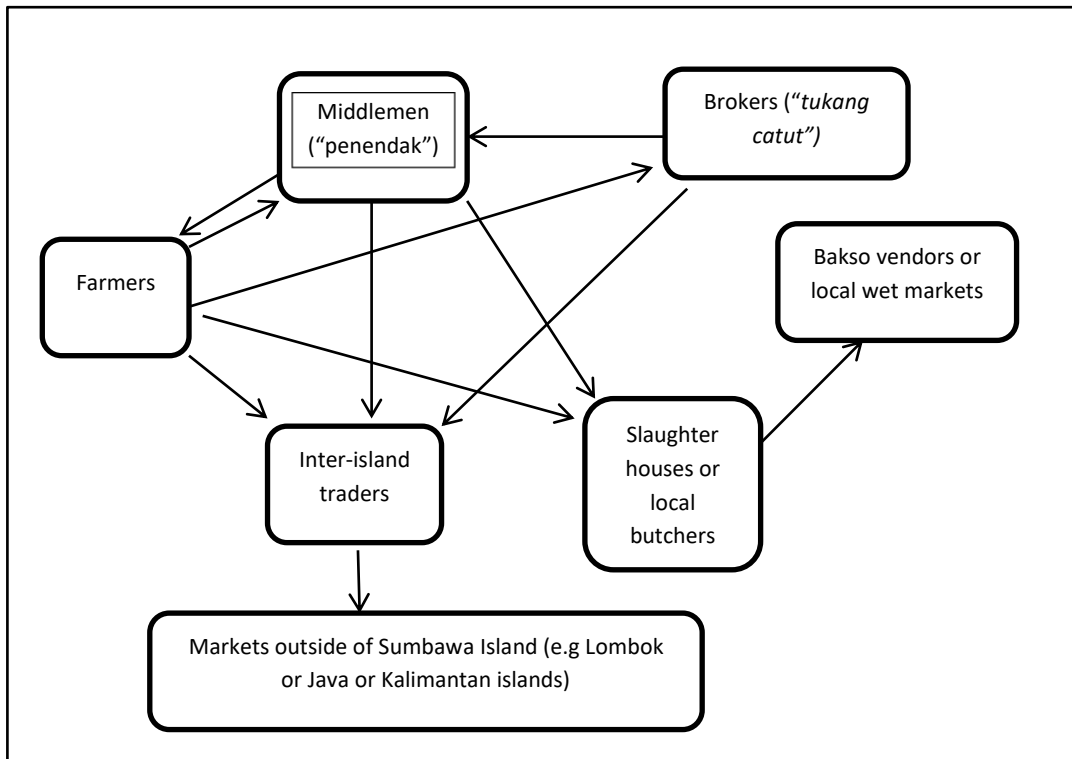


Figure 6.2 Cattle market chains in Transmigratory case

Most farmers in this case were involved in the local market system. The farmers sold cattle to a range of actors within the village (Figure 6.1). Local cattle markets in the Transmigratory case included farmers as producers who sold their cattle to different actors: middlemen or *penendak* (in Sasak language), or inter-island traders, slaughter houses. Farmers and *penendak* might also sell their cattle to other farmers in the village. Farmers could also inform brokers or *tukang catut* about their willingness to sell their cattle. Middlemen sold cattle to inter-island traders or slaughter houses. The inter-island traders transported their cattle to Lombok, Java, and Kalimantan. Brokers were usually the informants for farmers and buyers. Slaughter houses sold beef to *bakso* vendors, local wet markets, or consumers who bought beef in bulk for an event.

Most farmers sold their cattle to middlemen or “*penendak*” because cattle demand was always high and the middlemen were always looking for cattle. However, it was difficult for farmers to sell their cattle outside of the village because they only sold small numbers and transportation costs were high. They believed that the price they would

receive in other markets was not much better than the price they obtained in the village and they would have to outlay the cost of transportation.

Another market actor was the broker or a *tukang catut* who brokered deals between farmers and buyers. They informed buyers about farmers who wanted to sell their cattle, or vice versa. A *tukang catut* could earn between IDR 50 thousand and 100 thousand per cattle beast on any deal that they brokered from the farmer and the buyer. Farmers trusted the *tukang catut* to help them sell their cattle easily and obtain a good price. Sometimes farmers preferred to use a *tukang catut* to help them sell their cattle instead of contacting a middleman. They believed that the *tukang catuts* knew many of the middlemen and were up to date with current information about farmers wanting to sell cattle.

A broker could identify the middleman who offered the best price. However, if a farmer already had a middleman in his network, he could sell directly to them. If a farmer had a relationship with a particular local buyer or middleman, then they had an obligation to sell their cattle to them rather than to other local buyers. Owing to these strong relationships, buyers from outside of the village usually did not try to buy cattle from farmers in the village. Some buyers from other islands such as Lombok or Sulawesi did come to the village to buy imported breeds. However, they did not come very often and hence farmers could not rely on them. The local middlemen preferred to buy the local Bali cattle because the price was lower than the imported breeds and, thus, were easier to sell.

Sometimes, farmers sold their injured or sick cattle to the local butchers (Figure 6.1), or the farmers slaughtered their sick or injured cattle by themselves and sold the meat to other people in the village. Meatballs (*bakso*) were a value-added cattle product that was in high demand in the region and, therefore, influenced the demand for cattle. The butchers and local slaughter houses sold meat to *bakso* vendors.

How social norms shape cattle supply, demand, price, and smallholder farmers' decisions on cattle. In the Transmigratory case, there was no fixed standard of pricing for any cattle beast because the price was determined by the physical appearance, the ability of buyers and farmers (sellers) to predict price, and the bargaining power

between them. The national price might influence the local price to some degree, but it was still based on bargaining power. The national price was based on the weight and age of a cattle beast, but the local price in this case was based on the physical appearance of the animal. Farmers usually compared the prices that were being obtained from other farmers and, on this basis, chose the buyer to whom they wanted to sell their cattle. If a farmer was not happy with the price offered by a buyer, they could choose another buyer.

During the Eid Adha festival, market demand and price for male cattle at the regency level and outside of Dompu increased because slaughtering male cattle with a minimum age of two years was required for Muslims who wanted to sacrifice animals during the religious festival. However, this increasing demand and price did not attract smallholder farmers or producers to sell their cattle for those reasons because cattle are seen differently by the farmers. Farmers considered cattle as an insurance or savings and sold them when they needed money, rather than in response to market demand and price. The farmers would offer their cattle to several buyers to find the best price offered. However, the farmers would not wait for too long because they usually sold their cattle when they needed the money.

Cattle were not sold in a local cattle market or sale yard. The local market actors preferred to undertake their transactions on-farm or at the farmers' houses. By selling cattle locally, farmers did not have to cover the transportation cost to bring their cattle to a local market or sale yard. The local buyers usually transported the cattle to larger buyers outside of the village, or to other islands. The larger or inter-island buyers in Dompu or in Bima exported cattle to other islands for sale.

6.2.3. *Summary of the Transmigratory case*

Decisions on management of cattle (the number of cattle, nutrition and health, and labour) of smallholder farmers in the Transmigratory case were shaped by mixed aspects of their livelihoods. From the perspective of the Sustainable Livelihoods, vulnerability context, access and ownership of mixed assets, formal and informal institutions, and mixed income activities shaped smallholder farmers' livelihood outcomes as well as their decisions on cattle. Specific to cattle, this study identified that

these mixed livelihoods shaped cattle management practices (nutrition, health, labour, and marketing cattle).

There were at least three main sources of livelihood **vulnerabilities** that affected smallholder farmers' decisions about their cattle. They were shocks or emergency, development trends, and seasonality. Shocks happened when smallholder farmers faced emergency situations and they needed a huge amount of cash that could only be fulfilled by selling large assets such as cattle. Cattle were saved because smallholder farmers were reluctant to keep liquid assets. They preferred to invest their wealth in an asset like cattle that could be retained, yet could be sold easily when needed. When smallholder farmers could deal with shocks and fulfil their short and longer-term needs, their livelihoods were sustainable (**livelihood outcomes**) and this increased their opportunity to retain or to increase their wealth including cattle. However, as farmers had limited capability to farm cattle (e.g. limited forage and labour) smallholder farmers needed to reduce their cattle when the number exceeded the capability (forage and family labour) to keep too many cattle (**livelihood assets**). In order to be able to deal with shocks, smallholder farmers usually had mixed sources of income activities whether related to agriculture or non-agriculture (**livelihood activities**).

Development trends were expected to be a positive influence for smallholder farmers, yet they influenced smallholder farmers' decisions on how to deal with keeping cattle. The local government's development initiatives that were responded to positively by the farmers were crops, especially corn and rice. Corn was the main crop in this case because the farmland in the village was dominated by rain-fed land hence corn was more dominant than rice. Hence, during the crop growing season, cattle farming had issues around limited availability and access to forage and labour for cattle (**seasonality**). The condition of cattle farming was shaped by the social norm in this case. Transporting their cattle to the main grazing area at any time over the year was not a common practice in their society (**informal institution**). They kept their cattle in the cage or tethered them near their houses during the crop-farming season. This meant that the farmers had limited access to forage and labour so that the capability to keep more cattle was limited. When the smallholder farmers had the number of cattle beyond their capacity of forage and labour, they sold them. Regarding the gender roles

(**informal institution**), the women farmers were expected to stay close to their house. The women, especially in the women-headed households, had limited access to forage and labour to farm. **Formal institutions** were also influential in making decisions about retaining or selling cattle (e.g. access to formal credits and crop input grants). The ability to access these formal institutions might help smallholder farmers to retain their cattle, because the absence of sufficient liquid assets when needed, compelled the farmers sell their cattle.

In the Transmigratory case, this study identified that informal institutions shaped the smallholder farmers' responses to formal institutions. The smallholder farmers used healthcare facilities for healthcare and AI (**formal institution**). That was because the smallholder farmers raised their cattle intensively and kept a relatively small number (**informal institution**). For example, the smallholder farmers called vets from the local healthcare services when their cattle were sick or when they needed AI. However, the farmers did not usually apply for cattle cards (administration) because they viewed those cattle cards were applied for by the buyers who transported the cattle away from the village.

When smallholders could not afford to buy cattle there were several ways which enabled them to own cattle. They were *kadas-in* (shared farming) cattle or accessing the development programme (accessing free cattle grants). *Kadas-in* was a trust-based agreement between cattle owners and keepers on farming cattle (**informal institution**). This was because hiring labour for cattle was not a common practice, yet the shared farming system was available. This might enable both parties to overcome lack of capabilities to keep cattle. Accessing grants was possible, as far as smallholder farmers could join a livestock farmers' group. However, women also had little access to the livestock farmer groups. Moreover, the implementation of the cattle grant programme was prone to violation of the rules. An example of the issue faced by the cattle grant programme was the granted cattle were viewed as a saving strategy for the farmers, rather than for production, and they could sell the cattle they received when they need money.

6.3. The Local case

The Local case is based on Simpasai village and a description of physical and socio economic characteristics of the case is provided in Chapter 5. This section presents the factors that shaped smallholder farmers' decisions around their cattle. The first part provides examples of the role of smallholder livelihoods in shaping smallholder farmers' decisions about their cattle. All of the farmers in the Local case had a mix of assets and they used a range of livelihood activities by using the assets to sustain their livelihoods over the whole year. Formal and informal institutions also played out in the livelihoods and decision-making on their cattle. The role of smallholder farmer livelihoods in shaping cattle management practices is described later.

6.3.1. *The roles of smallholder farmer livelihoods in shaping smallholder farmers' decisions on their cattle*

This sub-chapter contains the key findings which describes mixed strategies in the farmer households' livelihoods that influenced management of cattle in the households. This includes the role of vulnerability context, followed by access and ownership of different mixed assets which influence decisions on increasing or reducing the number of cattle. The roles of formal and informal institutions in the smallholder farmer livelihoods as well as the roles of agriculture and non-agriculture related activities in shaping decisions on increasing or reducing cattle are also described in this section .

a. The role of vulnerability context in shaping smallholder farmers' decisions on their cattle

Smallholder farmers in the Local case had several sources of vulnerability. Similar to the Transmigratory case, development trends, seasonality, shocks and others were the vulnerabilities that shaped smallholder farmers' choices to sustain their livelihoods, which affected their decision-making.

The development initiatives in Dompu Regency that focused more on food crops had shaped smallholder cattle farmers' decisions on their cattle in this case. As the Government provided the largest support for food crop farming, many farmers grew corn on the available rain-fed land that was dominant in this case. At the same time, the

Government also supported the farmers who had access to irrigated land to grow rice as it was a staple food for the local community. The Government supported the corn and the rice farmers by providing free seeds and subsidised fertilizers. The development trends in crop farming had also influenced smallholder farmers' decisions on their cattle. The seasonality was also a vulnerability context for cattle farmers. During the crop growing season in the wet season, all of the farmland was covered with food crops. Cattle were prohibited to be released in the area of the Local case.

To deal with the food crop-growing season, the smallholder farmers had mixed livelihood conditions to deal with forage and labour. This shaped the smallholder farmers' decisions on their cattle including the number of their cattle and the necessary labour. How the vulnerabilities and other mixed livelihoods of the smallholder farmers interacted and shaped their decisions on their cattle is described in this section.

b. Access and ownership of various livelihood assets that shape management of cattle

Access and ownership of mixed assets were important for smallholder farmers to do mixed livelihood activities to sustain their livelihoods. The livelihood outcomes of different assets and activities shaped the smallholder farmers' decisions on their cattle. The assets were those related to agriculture including farmland and livestock. How access and ownership of these agricultural-related assets shaped decisions on cattle is described below.

Access to farmland in shaping livelihood income activities and decisions on cattle.

Among the farmers in this study, all of them used farmland primarily for crop farming which was the main income earning activity. Farmers' access to farmland comes through a number of ownership options. Some farmers owned their farms, others inherited land from their parents, some leased land and others leased-out their land to others to farm, while some farmers shared a farm with the landowners (the *garap* system).

Most farmers in this study owned farmland and the types of the land varied across the case. Some farmers had wet or irrigated land only, others had dry or rain-fed land only,

and some had a mix of both types. The types of land owned by the farmers determined what food crops were grown and the number of crops they could grow over the year. On wetland, farmers could grow crops over the whole year, and rice was the main crop grown on this land. Normally, they could grow two crops of rice and one of corn over a year.

Farmers could obtain land by either purchasing it, or inheriting it from their parents. There were different inheritance practices in this case. Some parents gifted their children their assets when they became elderly. In this situation, it was normal practice that the parents' property was shared equally between their children regardless of gender. However, different rules were observed when the parents died and the property was inherited. Sons received twice the inheritance received by daughters. The children could then use the inherited land so that they did not have to buy land to plant crops.

The size of the farms owned by farmers varied between 2,500m² and 12,500 m². In fact, not all farmers who owned land were interested in farming the land. These farmers leased-out land to other farmers. Some farmers also leased-in land when they needed to increase the size of their food crop farming enterprise, or if they did not own land.

Another strategy that landless farmers could use to overcome their lack of capital was by share farming with land owners. This arrangement is called *garap*¹⁷. By using *garap*, landless farmers could grow crops without having to lease-in land. The landless farmer provided all the inputs except fertilizers which were provided by the landowners. The crop yield was divided between the landless farmer and the landowner at harvest. The share of the yield that each party received depended on the agreement. For the landless farmers, the yield obtained from *garap* can be stored for consumption until the next rice-growing season and they could grow rice two to three times a year. If they needed cash, they could sell some of their rice stock. As rice was a staple food, it was relatively easy for farmers to sell rice to obtain cash.

¹⁷ *Garap* was a leasing system that was found in the local case but not in the Transmigratory case in this study.

Livestock was an agriculture-related asset which was interrelated with other assets in agricultural or non-agricultural sectors in smallholder livelihoods and influenced their decisions directly or indirectly on their cattle. This is explained below.

The role of livestock in shaping the decisions on managing cattle. Raising cattle is one of the livelihood activities used by farmers in the Local case. The functions of cattle were not to supply a regular income source; rather, they were seen as a form of savings and insurance. Cattle were sold when the farmers needed a certain amount of cash.

Similar to the Transmigratory case, cattle were the preferred form of savings because they could grow and reproduce unlike other liquid assets such as gold. They were also relatively easy to liquidate because local markets were available. The farmers who needed to sell their cattle only needed to call buyers to come to their place and undertake the transaction. This saved on transportation costs. Farmers could sell their cattle to local collectors or middlemen (*pelele*), slaughterers or butchers, or to other farmers.

The means by which a farmer obtained cattle varied within the case. Some farmers inherited or were gifted cattle from their parents. Some bought cattle when they had extra cash and wanted to invest in more productive assets. Alternatively, some used the share farming system called *kadas*, which is an arrangement between cattle owners and cattle keepers.

The rules of the *kadas* practice in the Local case were different from those in the Transmigratory case. In the Local case, the share was 2:1. In other words, if three calves were born, the keeper (*pengkadas*) received one and the owner retained the other two. *Kadas* was used by owners who wanted to run cattle or additional cattle, but did not have the labour to do so. Instead, they found a keeper or *pengkadas* to look after their cattle for a share of the calf crop. The sustainability of this model of cooperation was dependent on mutual trust. If the *pengkadas* was dishonest, the *kadas* mechanism failed. This happened when a dishonest *pengkadas* told the owners that the calves were dead, and the cattle owners failed to obtain any benefit after several years of cooperation. In this situation, the livestock owners took back their cattle or sold them.

However, if the *pengkadas* were trusted, both parties could gain benefits and the relationship was durable.

"I don't trust other people to kadas my cattle anymore. Based on my previous experience, the number of cattle did not increase as expected." (Mrs. Mawarni, line 362-363)

This study also identified that access and ownership of livelihood assets, including cattle, were shaped by the role of formal and informal institutions. Below is the description of how institutions played out in shaping decisions made to cattle.

c. The role of formal and informal institutions in smallholder farmers' decision-making in relation to cattle

In the Local case, loans or credit were a strategy embedded in farmer households' livelihoods. Most farmers were more familiar with informal rather than formal sources of credit to sustain their livelihoods, for both consumption and production purposes. More recently, some farmers had started using credit from formal institutions (e.g. banks). This section presents the findings around the use of informal and formal institutions in this case which shaped smallholder farmers' decisions on their cattle.

Government assistance for crop farming that influence decisions on cattle. In the Local case, the Government distributed seeds and fertilizers to farmers through farmer groups, and built infrastructure such as roads, dams for irrigation and markets. The Government usually distributed the assistance through the leader of each farmer group. The Government assistance reduced the farmers' input costs, which meant that they did not need to sell cattle to pay for crop costs. However, some farmers admitted that they did not receive these subsidies. When they asked their group leader why they had not received them, he said that the group had run out of the seeds or fertilizers from the Government.

When smallholder farmers did not receive a crop seed grant or subsidised fertilisers, they paid extra costs for their crop farming. To overcome limited cash available for

growing crops, the farmers accessed credit from formal or informal institutions, or by selling their cattle if they could not access any credit.

Regarding the use of farm labour, the farmers stated that the use of family labour could reduce both the cost of raising cattle and cultivating crops. Farmers did not pay wages to their nuclear family for their labour because it was expected that they would help out on the farm and it was to their benefit in the long term. For example, dependent children helped their parents as they realised that they needed the farm income to support their school fees and daily living. Independent children and parents also helped each other to save on labour costs.

“Me: After your sons got married, do they help you on your farm? Do you pay them? Or do you share the yield from your farm?”

Him: I usually give them money to buy cigarettes. But, if they had money, they didn't want to receive the money [from me].

Me: How they cover their daily needs?

Him: from their own land. Each of them has land.” (Mr Syaiful Yusuf, line 94-98)

Hiring labour was the highest production cost for crop farmers. Hence, when they could use their nuclear family for growing crops, the farmers could save the cost of farming. This would potentially increase profit of crop farming if the crop was successful. This also provided more opportunity to increase saving including to buy cattle. The following section presents the role of formal and informal credit facilities in shaping smallholders' decisions on their cattle.

The role of informal credits in shaping the decisions on cattle. Farmers who focused on crop production usually obtained credit from *rentenirs* as loans to buy inputs and pay for labor during the crop planting season. Farmers also obtained loans from *rentenirs* when they ran out of cash for daily consumption. This normally occurred during the growing season when farmers had no other sources of income because they were busy cultivating their crops. The credits from *rentenirs* could assist farmers in retaining their cattle because the loan could help farmers to sustain their livelihoods, especially during the crop-growing season.

Many farmers were not aware that they could access credits from banks and, hence, they were dependent on *rentenirs*. Farmers' were also dependent on *rentenirs* because they found it too complicated to source credit from banks. Banks usually require several documents from farmers such as land, or vehicle, or cattle certificates and, along with citizenship approval requirements, made them reluctant to apply for a loan. Although the interest rate on loans charged by *rentenirs* was up to 50%, farmers did not feel burdened by these rates because access to credit was relatively simple and quick to obtain. The loan was then repaid once the crop was harvested. For example, for an IDR 1 million loan, the farmer must pay IDR 1.5 million immediately after the harvest (four months to grow a crop). Failure to repay the loan would make it difficult for farmers to source a loan the next year. The high interest rates reduced the profit that farmers made from crop farming.

"Considering the situation, this way (borrowing money from rentenirs) is easier. The money is available whenever you need, rather than getting credit from a bank. Banks require too many requirements: certificates [of ownerships], which have to be handled (by the people)." (Group interview, line 41-42)

However, more farmers started to realize that they could access a higher amount of financial support from bank credits with lower interests than the informal credits. How formal credit shapes decisions on cattle is presented below.

The role of formal credits in shaping the decisions on cattle. A development initiative called the Credit for People's business (*Kredit Usaha rakyat*, KUR¹⁸), has resulted in many of the farmers applying for credit from the Bank Rakyat Indonesia (BRI). The KUR requirements were less complicated than those offered by other banks. Debtors only needed to provide proof of citizenship and a cattle or motorcycle certificate. Loans were provided for a longer period than those from *rentenirs*, six

¹⁸The Credit for People's business (Kredit Usaha rakyat, KUR) a bank credit product that is given to micro-business actors. This is a cooperative programme between the Indonesian government and the BRI in distributing credit as venture capital." (<https://www.infoperbankan.com/bri/kur-bri.html>).

months for planting food crops and 12 months for buying livestock. The size of a loan was also greater than those obtained from *rentenirs*. The interest rate for the KUR programme was only 8%, compared to up to 50% from *rentenirs*. Hence, according to the farmers in this study, the KUR programme was considered important for reducing their dependence on *rentenirs*. In response to this situation, some *rentenirs* in Simpasai offered lower interest rates of 10-20%. However, farmer awareness of the KUR programme was limited in the Local case and therefore, many farmers did not know about the availability of this credit facility. Hence, people's lack of awareness of the bank credit resulted in the smallholder farmers in this case study having to sell their cattle.

For some farmers, when they received IDR 10 million from the KUR programme, they used some of this money to purchase a bull for fattening, and the rest was used to finance the growing of corn. They fattened the bull as a form of insurance against corn crop failure, so that they could still repay the bank loan and the interest even if the crop failed. If the crop did not fail, then they could then sell the bull for profit.

Smallholder farmers had several strategies to manage their income from crop farming. They saved the profit from the previous harvesting season for the upcoming planting season. Similar to the Transmigratory case, some bought cattle or gold (usually saving in the form of gold done by women) as investments while others preferred to save their money in a bank or keep cash in their house for reserves. Some rice farmers also stored their grain in bags and sold surplus rice to support their needs which included buying crop farm inputs. Farmers that generated good profits from cropping and other livelihood activities mainly bought cattle as their method of savings. Some corn farmers bought small cattle a few months before the planting season fattened them and sold them just prior to the growing season at a higher price to fund the planting of their crops. This strategy helped farmers to fund the cost of crop production.

The pawn shop was an example of a formal institution which was also available in this case. However, none of the farmers being interviewed were using the service because they preferred to invest in more productive assets or running activities which generated income such as running a small retail business, brick or screen-making, or keeping livestock.

The following section is an example of the role of a non-agricultural form of formal institution which shaped smallholder farmers' decisions on cattle.

Free health insurance: how this supports the livelihoods of farmers in the Transmigratory case? A free healthcare programme (*Jaminan Kesehatan Masyarakat Dompu*, JAKKAD¹⁹) was provided by a local government initiative to help people in the Dompu regency. An illustration of the benefits of JAKKAD was revealed by one of the cattle farmers in this case. The farmer's wife was in a traffic accident and had to stay at the local hospital. To pay for the health services, the farmer would have had to sell a number of his cattle because the fee was very expensive. His friend informed him about the JAKKAD, and he applied for the programme. His application was accepted and most of the health treatments for his wife were covered by the JAKKAD. Therefore, he did not need to sell his cattle. As cattle are used as a form of savings or insurance, that is often used to cover unexpected health costs, access to free healthcare can reduce farmers' need to sell cattle if a member of their household requires medical treatment.

“Q: when your wife was sick [at the hospital], how did you pay the bill?

A: I used the JAKKAD card a special [facility] for people living in Dompu

.....

Q: So, when you use the [JAKKAD] card, was the service free?”

A: Yes, it was. Thanks God...” (Mr Ammanulloh in the interview with Mrs Ammanulloh, p.3, line 94-109)

People considered the JAKKAD programme as an alternative to health insurance if they did not use the health insurance provided by the *Badan Jaminan Sosial* (Institute of Social Insurance, BPJS), a branch of the national Government. However, JAKKAD is only applicable in the Dompu regency and, when someone had a very serious illness and had to be transferred to a larger hospital outside of Dompu, the JAKKAD programme was no longer applicable. Therefore, people felt that the BPJS health insurance was preferable because they could use it in any area in Indonesia.

¹⁹ JAKKAD is a free healthcare programme which was provided by the local government of Dompu Regency for every person who only lived in Dompu. However, to be able to receive the benefit of JAKKAD, a person needs to apply for the programme in the local government office.

Smallholder farmers' livelihoods included different mixed activities to sustain their livelihoods. The smallholder farmers' livelihood activities are related to agriculture and non-agriculture and those are mixed over the year to sustain their livelihoods. These are described in the following section.

d. Crop farming-related activities that shape smallholder farmers' decisions on their cattle

This section describes the crop farming livelihood activities that are undertaken by households in the Local case. The sections describe corn farming, rice and other crop farming, households' access to farmland, and access to government support for crop farming in relation to smallholder farmer livelihoods which also shaped their decisions on their cattle.

Corn farming and the relationship with the decisions on cattle. Similar to the Transmigratory case, more farmers in the Local case grew corn because it was less difficult to grow compared to rice. The corn price was better than other crops, and the crop was easy to market. Corn was promoted by the local government in Dompu Regency and affected both cases (the Transmigratory and the Local cases). The Government also provided a number of incentives to farmers which resulted in a high level of adoption of corn farming in the region.

In contrast to rice, corn was not stored for household consumption or as a form of savings to generate cash when required. Corn was primarily used to generate income so, in both cases in this study it had a different function from rice. The farmers normally sold the entire crop at harvest. Corn was viewed as a source of regular income rather than a crop that was grown to meet the consumption requirements of the household and provided a form of savings (e.g. stored rice). The income from corn was used to meet the households' livelihood requirements, however, once these were met, the surplus money was invested. Most of the farmers in this case invested their surplus income from corn into cattle depending on how much surplus they gained.

The cost of growing corn was higher than the cost of growing rice. To cover this cost, farmers used several strategies. First, they would borrow from either formal sources of

credit or informal sources of credit such as money lenders. Their choice of the source of credit depended on their ability to access the credit from formal institutions and the scale of their corn production. However, large corn farmers could obtain credit from a bank. To do this, they needed to provide collateral (e.g. vehicle certificate or cattle cards). Farmers could borrow money from money lenders, but the amount of money they could borrow was not as much as from a bank. Moreover, the interest rate they paid to informal money lenders was much higher than that charged by a bank. Many of the farmers preferred to borrow from informal money lenders because the process was faster and simpler. Furthermore, borrowing money from informal money lenders did not require collateral and complicated administrative procedures as in applying for bank credits.

The Government provided inputs and subsidised fertilizers to corn farmers, but to obtain the inputs they had to be registered with a crop farmer group. These farmers received free corn seed and subsidised fertilizers which helped reduce the cost of growing corn. This might influence farmers to retain their cattle because if farmers needed too much money for cropping costs, they could sell their cattle. However, often this assistance arrived late and the farmers had to buy their crop inputs from commercial companies at the market price to ensure their crops were planted on time. Often the free inputs arrived after the crop was planted, and the farmers might sell their cattle if they did not have enough cash available. The farmers often then sold the inputs, to other farmers who started their cropping later.

To harvest their corn crop, the farmers hired labourers and paid them with cash on a daily basis. The farmers could sell their corn crop in the paddock or they could harvest it and take it home to be dried. The moisture content of the corn influenced the sale price. The local government provide a moisture meter so that farmers could check the moisture content of the grain. Farmers preferred to sell their corn yield on the farm because they did not have to transport it to market.

The price for corn fluctuated, reflecting the national or the global market price trend. Sometimes, the total yield in the region (regency) was low, while the demand was high. Sometimes, the corn price dropped because of overproduction in the region, or the

global market had fallen. Although the price was uncertain, farmers continued to grow corn because the market demand was always good and the marketing of the crop was relatively simple and convenient. The farmers, who had wet or irrigated land, grew rice. This is presented in the following section.

Growing rice and the relationship with the decisions on cattle. The farmers in the Local case had more wetland than the Transmigratory case. Therefore, more farmers in this case focused on growing rice because their farmland was irrigated land. They could grow rice two to three times a year (the whole year). The rice farmers received free rice seed and subsidised fertilizers if they belonged to a crop farmer group. For smallholder farmers, they borrowed money from informal money lenders (from *rentenirs*²⁰ or relatives) to cover the cost of growing the crop while others accessed bank credits, or sold cattle. They repaid the money once they received payment from selling the yield.

Rice farming provided a number of functions. Firstly, it was grown for consumption purposes. Rice surplus to consumption needs could be sold as a source of regular income or it could be stored as a form of savings or insurance. Some of the farmers did not consider rice as a regular source of income but grew it for consumption and as a source of savings or insurance. These farmers tended to have smaller areas of rice land.

To grow rice, the farmers hired labourers for planting, weeding, applying fertilizers and pesticides, and harvesting. However, this depended on the area in rice. If the land was too small (less than half hectare), the farmers used family labour. During harvesting, farmers hired labourers and paid them with rice. The payment was based on a percentage of the yield.

For marketing, the farmers usually sold their rice on-farm to a buyer. This was preferable to the farmers because they did not have to cover the post-harvest and marketing costs.

The following section describes other crops which were grown by some farmers to help them sustain their daily consumption.

²⁰ Rentenirs are individuals who lent money to people for business or consumption. Yet, a farmer may borrow money from his or her relatives or family (parents or siblings) with no interest.

Growing other crops and the relationship with the decisions on cattle. Similar to the Transmigratory case, the smallholder farmers in the Local case grew some crops on their farmland other than corn and rice. After growing corn, the farmers usually grew mung bean when there was still enough water to grow the crop. They chose mung bean because it did not need much water, it did not require inputs such as fertilizers or pesticides, and they only needed to buy the seeds. The farmers did not hire workers for the mung bean farming; they used their family labour. Mung bean yield had the same functions as rice, some of which was sold and the rest was stored for daily consumption and saving. Growing mung bean after the main crops helped smallholder farmers to raise as much income as they could for their households. This could also help them prevent a tough economic situation which would force them sell their cattle.

To sum up, the smallholder farmers in this case had three main crops (corn, rice, and mung bean) which were considered the sources of income for their household livelihoods. Some saved the yield of crops for consumption or for saving. These three crops were chosen by the smallholder farmers who had access to farmland.

Smallholder farmers did not only work on their farm to earn income, but they also worked on other farms to earn extra income to support their livelihoods. This is explained below.

Working as farm labour as another alternative income activity. Households in the Local case commonly use a range of daily-income earning activities to support their livelihoods. These activities could be on-farm or off-farm. Some provide regular income and some do not. Working as a farm labourer is usually undertaken during the food crop-growing seasons. These activities are usually available every day of the year since most farmers in the village have irrigated land and grow crops year-round. The peak season for labour demand is during the wet season, when almost all types of land are used to grow food crops.

Some smallholder farmers earned income from non-agricultural activities. These activities also shaped their decisions on cattle. This is presented in the section below.

e. Non-agricultural types of income activities in shaping management of cattle

The majority of the farmers in this study earned income mainly from growing food crops (corn and/or rice). These farming activities were regular seasonal income events. The crops could provide income every crop-growing season, yet farmers could get the income after they sold the yield. Some of the farmers also combined their main income activity with other activities such as daily-wage income activities, running a small shop, brick-making, and/or bamboo-screen making. Several types of non-agricultural activities in the Local case were different from the activities in the Transmigratory case. These activities provided small, but regular incomes in shorter periods (daily-based) than they received from crop farming. These activities may directly and indirectly shape the decisions on management of cattle of a household. These mixed activities might secure smallholder farmers' economic situations, especially to fulfil the day-to-day needs. Hence, the farmers could retain their cattle or increase their savings or investment in cattle when they were economically secure.

Brick-making and the relationship with the decisions on cattle. The farmers often used small-scale industries such as making bricks and bamboo screen-making to earn income for their livelihoods. The farmers used profit saved from corn farming to make bricks throughout the year. According to brick producers, brickmaking does not require much capital, but the income from this industry is useful in supporting their households. Brick producers generate enough profit to save money and they may use this to buy cattle. Landless farmers did not need to lease-in land to make bricks but, rather, they shared the bricks that were produced with the landowner. For example, one brickmaker stated that *"From 10,000 bricks, 2,000 are for the landowner"* (The farmer group interview, line 145). Farmers provided the brickmaking tools themselves, such as hoes, buckets, brick moulds, a tarpaulin roof and wooden pillars to cover the bricks, and firewood to fire the bricks. They sold their bricks at the place where they made them to save on transport costs.

Bamboo-screen making and the relationship with the decisions on cattle. In addition to brickmaking, farmers also produced bamboo screens as another source of

income. The income from bamboo screens was used to fulfil the farmers' daily needs, to buy raw materials, or for saving. This activity was not directly related to the decisions on cattle. Yet, it helped smallholder farmers to sustain their day-to-day livelihoods because the income from this activity was not significantly high. When the smallholder farmers were able to fulfil their daily needs through the mixed income activities including through making bamboo screens, they could retain their cattle.

Farmers made bamboo screens throughout the year when they had free time as well as during the planting season. They usually did this activity during their break times during the day. To obtain financial support, bamboo screen producers received a down payment from bamboo screen middlemen (*pelele*). This special arrangement between the screen producers and the *pelele* helped reduce production costs. To ensure a continuous supply of screens, the middlemen usually gave IDR one million to each producer on the expectation that they would start providing screens within two weeks. Failure to supply resulted in a loss of trust between the middle man and the farmer supplier. The down payment was used to buy bamboo, transport the raw materials, and pay for labor (for the weaving of the bamboo). The raw materials were usually prepared by the men, while the women hired workers who wove the bamboo into screens. Labour was paid IDR 5000 for three bamboo screens. Transportation costs depended on the distance the farmers must travel to the source of the raw material. Sources of bamboo near the village were limited, so farmers had to travel out of their village to buy bamboo trees from other people. To reduce transportation costs, a group of farmers would rent a truck and share the costs.

Some bamboo producers sold their screens direct to markets to obtain a better price. For example, the price of bamboo skin screens was IDR 100,000 per screen if they sold them to middlemen, compared to IDR 120-130 thousand when they sold them to the markets. The price of screens made from inside part of the bamboo trunk was IDR 25 thousand per package (two screens per package) if farmers sold them to middlemen, while the price in the markets was IDR 40 thousand per package. However, bamboo producers sometimes needed the down payment from bamboo screen middlemen to support their business.

Other alternative income activities and the decisions on cattle. In the Local case, some cattle farmers interviewed did not grow food crops or take on-farm labouring jobs. Instead, they worked off-farm. Some of the cattle farmers became motorcycle taxi riders. They received payment for providing transport for people and goods in the area. Some cattle farmers worked as staff at an office, as a school teacher, or as construction workers. Other farmers operated grocery shops or grocery retailing activities at their house. The cattle farmers in this study who ran a small shop were women-headed households. They could fulfil their daily consumption needs from running these activities.

The cattle farmers were not involved in other income activities in agriculture for various reasons. Some of them did not have access to farmland, whether their own or leased land. Some had farmland but they preferred to do non-crop activities because growing crops was not their passion. These activities enabled them to earn income for daily-based income activities while keeping their cattle.

In regard to smallholder farmers' decisions in farming cattle, there were various other factors in their livelihoods which influenced their decisions on cattle management practices (cattle production, marketing, and labour). This is described below.

6.3.2. *The role of smallholder farmer livelihoods in influencing their decisions in relation to cattle management practices*

Farmers in the Local case used various strategies to raise cattle. Some of the farmers kept their cattle in the village the whole year. On the other hand, some of the other farmers travelled to the main area of common grazing land and kept their cattle there, especially during the crop growing season. The following sections describe factors that affected smallholder farmers' decisions on the cattle management practices, which included cattle health, nutrition, and labour. This also includes the role of formal and informal institutions specifically in cattle production and markets that shaped the farmers' decisions on their cattle.

a. The roles of food crop farming, forage availability, and institutions in shaping smallholder farmers' decisions on cattle

A myriad of factors influenced the availability of forage for cattle farming in this case study. They ranged from the vulnerability context, the portfolio of the farmers' assets, the livelihood activities the farmers had adopted, and both formal and informal institutions (Figure 6.3). Firstly, formal institutions played an important role in the influencing forage availability in the local case. The corn policy set up by the Government influenced the widespread adoption of corn growing in the village as described in the previous case study. Second, the vulnerability context in relation to seasonality required farmers to grow corn during the wet season.

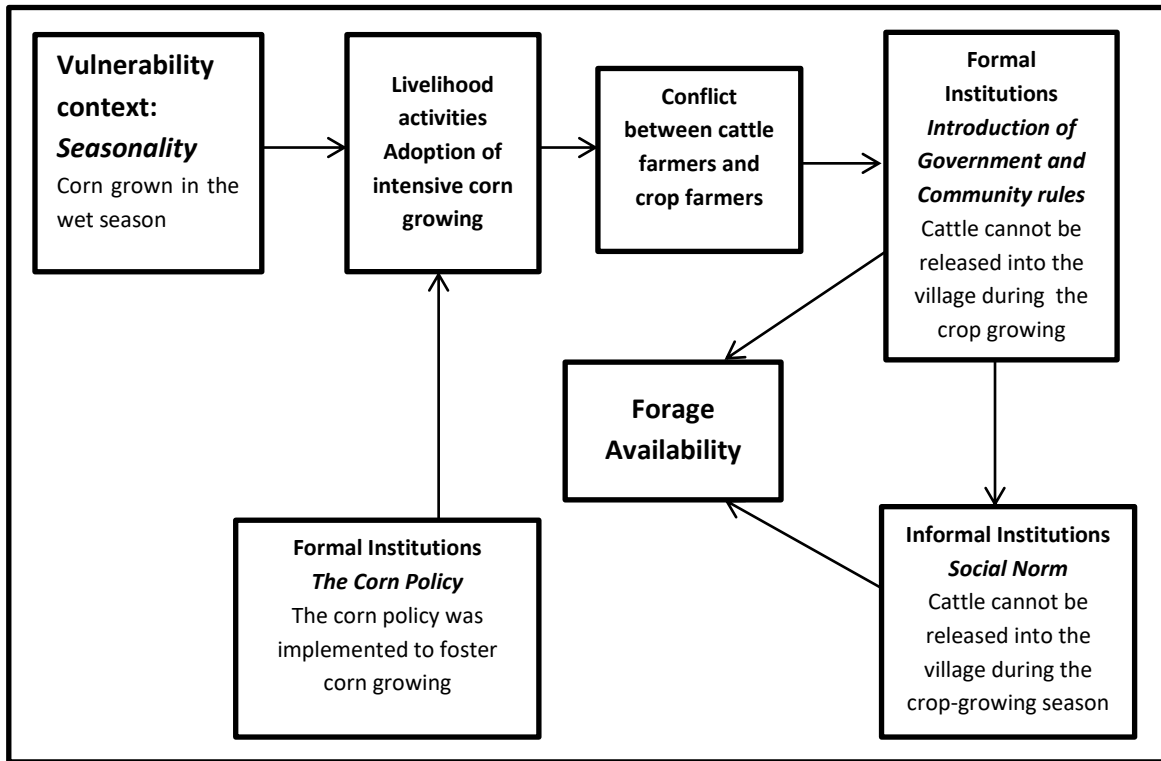


Figure 6. 3 factors that influence forage availability

The consequence of extended corn planting during the wet season was that there was limited access to grazing and other forage sources for cattle in the village during this period. In the past, a lot of land was available for grazing cattle in the village because

farmers cropped it intensively. Previously, farmers planted mung beans or soybeans on their dryland during the rainy season. However, they could still graze their cattle during the planting season, especially on the hilly areas because the land was too dry to plant food crops. To date, corn was planted throughout the village, including the hilly areas. This often created conflict between cattle farmers and landowners when cattle entered farmland during the crop-growing season and damaged the crops. Crop farmers retaliated by injuring the cattle. In response to this, government and local community rules were introduced prohibiting the release of cattle in the village during the corn-growing season. Consequently, it became a social rule, where cattle owners had to pay compensation to the crop farmers or landowners if the cattle entered land where corn was grown.

“I contacted the cattle owners and asked him to pay for the damage caused by their cattle to the crop owners... However, we have “musyawarah” among us here so that both parties will be reconciled...” (Mr. Syaiful Yusuf, p. 30, line 1064-1069)

However, the conflicts did not always end up with the cattle farmers paying compensation to the corn farmers. They also could be overcome through deliberation and consensus called “*musyawarah*” and “*mufakat*”²¹. In overcoming conflicts among cattle and land owners during the crop-planting season in this case, the local leaders facilitated meetings between parties through the “*musyawarah*” to achieve consensus between the two parties.

In dealing with the problem of forage access during the rainy season, cattle farmers had developed several alternative ways of feeding their cattle. Some farmers sent their cattle to the main common grazing land of Doro Ncanga at the foot of the Tambora Mountain. It is located in the Pekat district, and can be reached by vehicle within two to three hours. When farmers released their cattle into the grazing land, they branded them to identify their ownership. Farmers sent their cattle to the common grazing land

²¹ “*Musyawarah*” or deliberation is a traditional decision-making rule in Indonesia to achieve consensus or “*mufakat*” (Kawamura, 2011 <http://www.ide.go.jp/English/Publish/Download/Dp/308.html>).

if they had too many cattle in relation to the forage availability in the village during the wet season. Furthermore, they did not have the labour to source forage for their cattle (see diagram 6.4). This strategy was available to farmers because there was a long-standing social norm, an informal institution that allowed all farmers to graze their cattle on the common grazing land. This land could not be owned by individuals, but was common property to the community, and all community members could access this land.

An important asset that facilitated the grazing of cattle on the common grazing land was the social capital of the farmers (Figure 6.4). This study provides an example of the importance of social capital and collective action. Farmers sent their cattle to the common grazing land, and they usually did this in groups of friends or family members because it had several advantages. First, the transportation cost was cheaper when they did it together. Farmers usually contacted other farmers and rent a truck to transport their cattle. They built small huts in Doro Ncanga (Figure 6.2), where they could rest and stay overnight. Second, farmers in such a group took turns to visit and monitor the cattle. Communication devices such as mobile phones were also important as a means of communication among farmers. They updated the condition of friends' cattle, by taking pictures of the cattle that might be sick or giving birth and these were sent to the owners of the cattle. Accordingly, an informal institution in the form of a social norm in relation to reciprocity was important here. Farmers were expected to take turns at looking after the groups of cattle at the common grazing area.

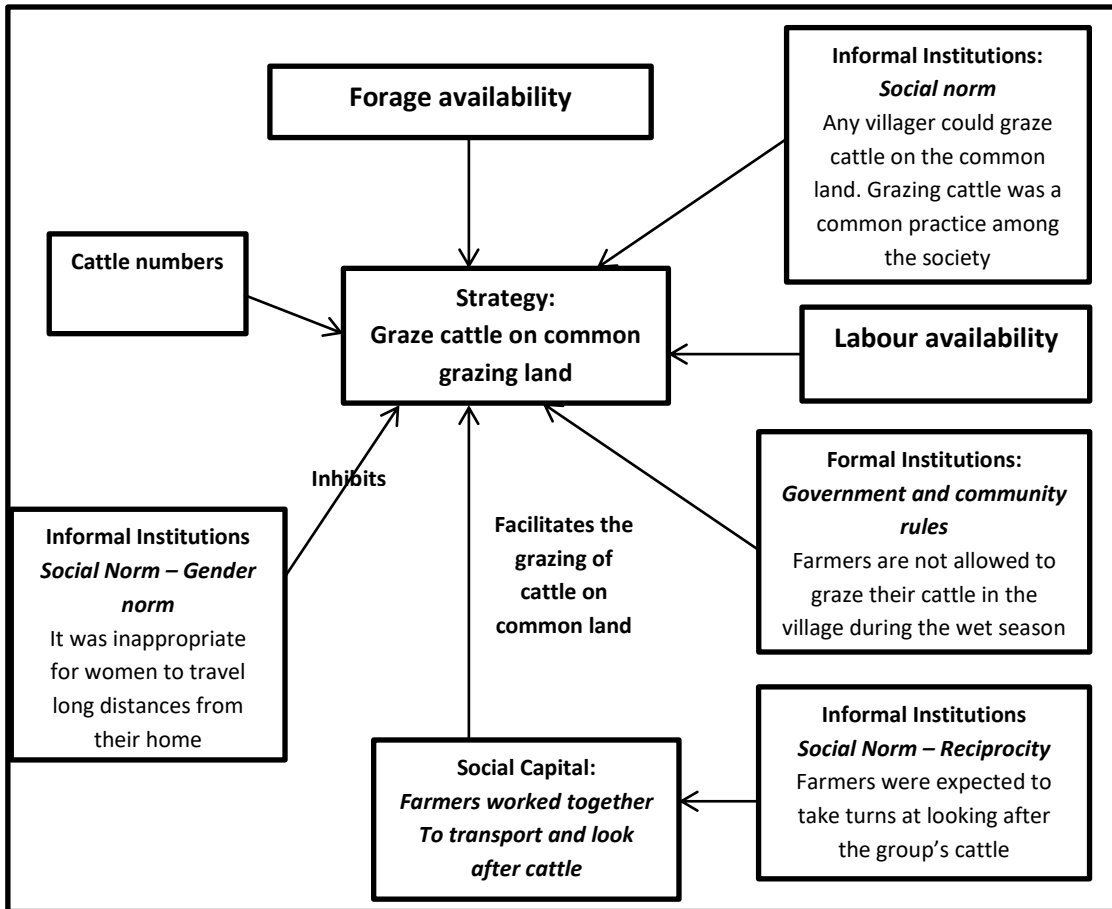


Figure 6. 4 Smallholder farmers' responses to the lack of forage availability

Rather than graze their cattle on common land, some farmers chose to keep their cattle close to their houses by tying them up or keeping them in stalls. Some land owners who did not grow food crops, but had cattle, put their cattle on the land that was not used for growing crops. They did not send their cattle to the common grazing land for several reasons. Farmers who did not graze their cattle in the main grazing land preferred to release their cattle in the forests near their village or keep them close to their house. They did this because it meant they did not have to pay the cost of transporting the cattle, and it saved them time because they did not need to visit and monitor the cattle at grazing. A local farmer stated “... better to [raise cattle here]. If I bring them to Doro Ncanga, it will cost me money for transportation...” (Mr. Jamal, p. 4, line 149-150). The farmers felt that they could manage to look after the cattle in the village. Basically, there was no clear reason among farmers why they went to the common grazing land and kept their cattle there, and why some other farmers did not do that. There were various

reasons for keeping their cattle in the main grazing land such as farmers were being risk-averse. Whether they have few or many cattle, some farmers kept their cattle close to their house because they did not want to lose their cattle. However, grazing cattle or not were optional strategies of cattle farming, especially for the male farmers. On the other hand, some others did not go to the grazing land because they were women (especially the women-headed households). In this society, it was socially unacceptable or inappropriate for women to travel large distances from their homes. This was a social norm related to gender and women who violated this norm were sanctioned. Thus, women, and particularly those from female-headed households avoided taking cattle to the common grazing land. The farmers who raised their cattle in the village during the planting season had to spend time collecting fodder and feeding and watering their cattle.

This study identified the farmers' responses to cattle development initiatives also shaped their decisions in farming cattle. This is presented below.

b. Farmers' responses to cattle development initiatives in shaping smallholder farmers' decisions in farming practices

Development interventions for farmers were mainly provided by the Government. These government initiatives include cattle grants, subsidised health care and artificial insemination. Social norms also played an important role in determining the adoption of these development initiatives by farmers.

Smallholder farmers' response to cattle grants. The implementation of the cattle grant programme by the Government in terms of the distribution of the funds in Dompu tended to favour certain groups in the community. Nepotism was rife and the legislative members who distributed the funds tended to provide them to family members, relatives and friends. This was confirmed by staff members in government departments who were part of this study. The Livestock Department of Dompu regency (who managed the funding from the legislative members) provided the cattle grants to the individuals who were chosen by the legislative members, without consideration of whether or not these individuals had met the criteria.

“We received the names [of recipients from the legislative members] without verification. When we checked them on the field, [we found that] they were their people (the legislative members’ family or relatives). So, what can we do?” (Mr Akramul Karim, line 418-419).

The Government had set up a revolving system by which the cattle grants were provided to farmers. A farmer group was required to identify the first lot of members to receive the cattle grants. These farmers were given a few cattle each and they used them to rear calves. The plan was that once this first batch of farmers had reared a calf, the cattle would be passed onto members who had not received the grant and they would use the cattle to rear calves. However, the farmers realised that the revolving system took a long time to implement. Thus, the farmer groups distributed the free cattle to all the members at the start of the programme instead of providing some cattle to some of the farmers and then “revolving” them to other farmers once the first batch of farmers had reared some calves. Most farmers retained the cattle and reared them. These cattle might be sold if the farmers needed cash for some emergency or important social occasion such as a wedding. This practice was driven by a social norm around fairness. Some of the farmers in an emergency who only had the granted cattle to be sold as an option, immediately sold them to obtain cash. However, this violated the Memorandum of Understanding (MoU) between the Government and the farmer groups where the expectation was that farmers would retain the cattle and increase their cattle production..

“There were some members who sold the cattle they received (from the Government), but the people from the Dinas suggested to me not to sell the cattle. Since that time, I have raised cattle and resulted in more cattle. I can cover my family daily life from raising cattle.” (Mr. Ammanulloh line 60-63)

The Government tried to impose sanctions on farmer groups where members were selling cattle for unacceptable reasons. However, these rules were difficult to enforce. The Government tried to blacklist the groups that did not follow the MoU. The blacklisted farmer groups were not provided further cattle grants. Basically, the Government preferred to grant cattle to the farmers who were already running a

reasonable number of stock rather than the farmers who did not have any cattle. This was related to the Government's awareness of the common function of cattle for the smallholder farmers and the potential decision would be made by them to the granted cattle. The problem with the farmers with no cattle was that they usually sold the granted cattle to obtain cash rather than retaining them to produce progeny and improve beef production in the area. For those who previously did not have any cattle usually sold their cattle when they needed cash, and did not continue their farming activity anymore. The Government believed that the farmers who farmed a large number of cattle were more reliable and used the grant to expand their cattle herds rather than selling them for cash. However, the political will of some politicians (the individual members of parliament) often determined the decision on who received the granted cattle, which was based on kinship.

To sum up, the cattle grant programmes that were offered by the Government faced a number of problems. However, the Government continued to apply the same mechanisms for the allocation of cattle grants, despite these proving to be ineffective. The Government struggled to sanction those farmers that did not follow the rules associated with the cattle grants. In addition, nepotism often prevented the funds being allocated to the appropriate people.

The influence of gender norms in shaping access to development initiatives for cattle. For the Local case, it was found that social norms influence how gender roles shaped households' activities in raising and marketing cattle. Gender, and the social norms associated with gender also influenced men and women's responses to the Government initiatives aimed at cattle.

Some households had clear divisions of labour in men-headed households (MHHs). Women tended to manage the crop farming and men raised the cattle. In MHHs, men usually managed the cattle while women managed the crop planting. The husbands were responsible for collecting fodder, providing water, releasing cattle into grazing areas, looking after the health of the cattle, and communicating with middlemen when selling their cattle. Fodder for the cattle was collected twice a day, in the morning and late afternoon. The wives and children collected the fodder in the morning while their

husbands undertook other income-generating activities. In the afternoon, the husbands collected the fodder. Wives would also help in providing water for the cattle. When the husbands were away, the women took responsibility for looking after the cattle. However, there were some women who did not help their husbands with looking after the cattle because they were afraid of them. In such cases, the husbands usually asked friends or family for help to raise the cattle when they were away.

In terms of crop management, women took more roles. They contacted and paid the workers, bought inputs, managed the crops, and contacted the middlemen to buy the yields as well as prepared food for the labourers they hired. Husbands usually helped with the crops and were an important source of unpaid labour. The husbands also undertook other livelihood activities when they were not working on their farms such as doing social work, for example, helping with public construction (e.g. building roads or a mosque), or earning money from non-farming activities (e.g. being a taxi driver or a construction worker). Women were trusted to manage the crop operation because they had good communication skills and networks with the workers, input sellers, money lenders, and middlemen. They also had good negotiation skills when it came to negotiating a price for their crops.

“Lobbying is the women’s role because they are better in bargaining.” (Mr Daliman in the Mrs Daliman interview, line 390-391)

It was believed that women were better at bargaining. They were more determined in convincing *peleles* (who were usually men) about the price they wanted while men did not want to waste too much time on bargaining. However, before selling their crops or cattle, the husband and wife normally discussed the price they wanted so that there was no dissension when the wife agreed to a certain price with the *pelele*.

In some MHHs, the husbands managed both the cattle and crop enterprises because the wives were busy with other kinds of livelihood activities such as home-based small businesses or looking after the house and the children. *“I manage everything because women have too many plans, while me... I just need food and cigarettes.” (Mr Syaiful Yusuf, line 345-346)*. In some households, the husbands managed the farming activities

because they did not believe their wives had the financial management skills for this work.

Social norms linked to gender limited women's involvement in public activities such as membership of a farmer group or attending farmer group meetings. Women were not usually involved in public meetings as the prevailing social norms viewed these as "men-related" activities. This limited women in women-headed households' involvement in cattle development initiatives. Some women were involved in public meetings, but their role was to provide food and drink at these meetings, and they were not permitted to speak at the meeting. As the government programmes were delivered primarily through farmer groups, women, especially the WHHs, were excluded from these government initiatives. However, women in MHHs got slightly better access to group activities compared to the women in WHHs because their husbands, or other males in MHH households, shared what had happened at the meetings.

Smallholder farmers' decisions on cattle healthcare in response to the government initiatives. Although artificial insemination of cattle was meant to be a free service to farmers, it was found that farmers usually paid an average of IDR 50 thousand when they called the officers for each individual service. Some farmers, who could not afford the full payment, would pay less than this. As they had to pay the government officers for the AI service, a number of farmers were reluctant to use it, particularly the poorer farmers who did not have the cash. Rather, these farmers preferred to mate their cattle naturally. Often this resulted in in-breeding, or cattle were mated with inappropriate breeds. Moreover, there were some farmers, especially female-headed households (WHH), who did not know that the AI programme was free, for example. "*Tidak pernah ada orang datang menjelaskan tentang IB ini*"²² ("*No one ever explained about the AI programme.*") (Mrs Dahniar Rena, line 114).

²² Participant quotes have been translated into English from Bahasa Indonesian by the researcher. Those are from the direct quote of a participant in Bahasa or translated by a research assistant into Bahasa from a participant's local language. For some quotes where the participant spoke in Bahasa the original quote is included along with the English translation.

c. The nature of cattle markets in shaping smallholder farmers' decisions on cattle

The cattle markets in this case involved a traditional marketing system. The study highlighted that social norms shaped the supply and demand of cattle, and cattle market chains. This section includes how the cattle markets and social norms shaped smallholder farmers' decisions on their cattle.

How the cattle market shapes smallholder farmers' decisions on their cattle. In beef cattle and meat marketing in the Local case, trust played an important role in the relationships between the actors. The actors in the cattle or meat marketing assumed that trust was a form of capital that could make the selling easier for the farmers. When smallholder farmers needed cash and cattle were being sold immediately, they could contact the trusted buyers. The buyers could come immediately and bring the cattle without bargaining and payment first. However, the buyers sold the cattle first to other buyers and paid the farmers when they received payment. This was often easier for the farmers when they needed to sell their cattle because they had already had a mutual understanding with the buyers.

The development of trust between farmers and the other actors in the market chain was influenced by several factors. This included the longevity of the relationship. The behaviour of both parties met their respective expectations, honest interactions between farmers and market chain actors, the frequency of the interactions between farmers and the market chain actors. The farmer pointed out that trust could not be developed quickly and that it took a long time to build trust in a relationship. Both parties had to be honest and deliver on the expectations they had agreed to in any negotiation. Trust was also built where frequent communication occurred between farmers and the market chain actors. Proximity was important here, because farmers who were further away from the main centres where the market chain actors were based had less contact with the actors. However, in cattle trading, a formal cooperation (a joint venture) was not preferable because that was not a common practice among them.

In the Local case, the cattle market actors usually involved were farmers as cattle producers, middlemen (or *pelele*), slaughter houses or butchers, larger traders (agent), wet markets, restaurants, and consumers (Figure 6.5)

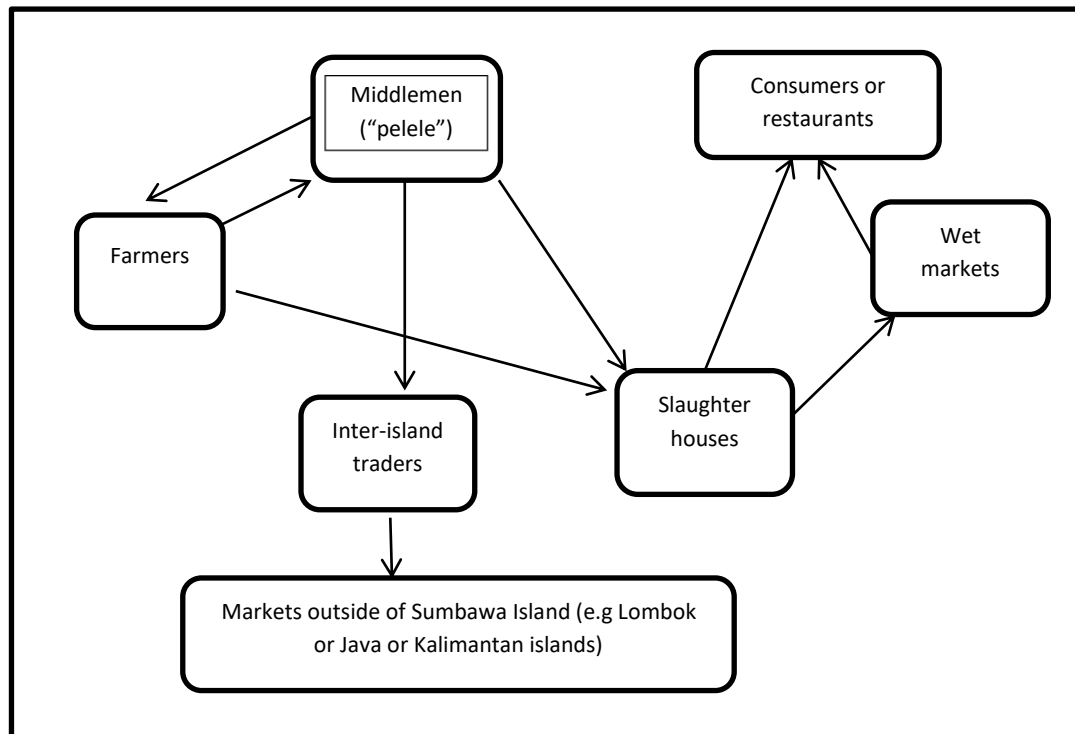


Figure 6.5 The cattle market chain in the Local case. Source: data collection and analysis

Farmers sold their cattle to middlemen that, in this case, was called *pelele*, or to slaughter houses. Middlemen or *pelele* sold their cattle to larger buyers those were inter-island traders. Some farmers and *pelele* also sold their cattle to other farmers who wanted to buy cattle. Slaughter houses or butchers bought cattle from farmers or *pelele*, and the beef was sold to wet markets or directly to the consumers who bought in bulk.

Farmers preferred to sell their cattle to middlemen rather than bring them to market. This was because the process was simpler and it did not incur costs such as the transportation of cattle to the local market. The farmers in this case preferred to call a

pelele (middlemen) using a mobile phone and completing the transaction because it was more convenient. The *pelele* would then come to the farmers' farm with a truck soon after they were contacted. Importantly, there were a numbers of *pelele* looking to buy cattle in their village at any one time and this competition for cattle provided the farmers with some bargaining power. The bargaining process between farmers and a *pelele* was an iterative process where the farmers would contact a number of *pelele* in order to obtain the best price. However, some of the farmers believed that there was collusion between the *pelele* in relation to the cattle price because there was little difference between the prices offered by the different *pelele*.

Importantly, the price offered by *pelele* was also better than the price offered by the slaughterhouses and so farmers did not sell direct to the slaughterhouses unless their cattle were sick or badly injured. Both the slaughterhouses and local butchers were happy to accept sick or injured cattle because they could offer a much lower price. The price of cattle normally cost around IDR 6-7 million and would drop to around IDR 2-3 million if they were sick or injured. Sometimes, the *pelele* would also buy sick cattle from farmers and then on-sell them to the butchers or slaughterhouses.

The *pelele* believed that farmers did not sell their cattle directly to the larger buyers in the market chain, particularly the larger traders (wholesalers) who exported cattle outside the Island because they provided small numbers of cattle while the wholesalers received a large number of cattle at their house. The farmers preferred to sell to the middlemen, or *pelele*, because they were willing to buy a small number of cattle and would collect the cattle at the farm gate.

This study found that trust between the actors in the market chain, including farmers, reduced the need for financial capital during transactions. Farmers entrusted the middlemen to bring their cattle to market and that they would receive payment for their cattle when they were sold. Similarly, butchers entrusted food vendors to pay them for the meat they purchased after the vendors had sold their food products. The butchers also tried to ensure that the quality of their meat was high so that the food vendors continued to buy meat from them. This mechanism of delayed payment did not change the price of the goods being traded. For example, a new middleman that had not gained

trust with farmers had to pay cash directly on the day they brought the cattle and paid the same price as the other vendors that did not pay the farmers until the cattle were sold. This is an example of where social capital acts as a substitute for financial capital within the market chain. However, this trust was dependent on an informal institution, the social norm of reciprocity. The farmers were willing to provide their cattle to the middlemen without payment, provided they were paid soon after the cattle were sold. Failure by the middlemen to meet this expectation resulted in the violation of the social norm. Failure to meet these expectations resulted in sanctioning and a farmer would not deal with that buyer again. This was also the case between the other actors in the market chain. A similar social norm existed between butchers and food vendors. The butchers would lose buyers if they did not follow the social norm, because the food vendors would find another butcher that was willing to delay the payment. The actors considered this trading system (the delayed payment) as helpful for all parties. It reduced the need for working capital and, instead, this was replaced by social capital.

“Indeed, we need capital. Being trustworthy is the main capital. For a new middleman, you need much [financial] capital. [You need] minimum of IDR 50 million, because you haven’t gained farmers’ trust yet. But if they have entrusted you, you can run this business without financial support.” (Mr. Hajarwadi, line 97-100)

This market mechanism where trust or social capital replaced the need for working, or financial capital was locally based, because proximity was a key factor. If the actors were local, then any problems could be sorted out easily because people lived nearby. However, this relationship and social norm did not hold between the local people and actors who lived outside the area. For example, cattle farmers from Sumbawa regency only trusted the middlemen from the same regency in relation to the delayed payment system. However, they did not trust middlemen from Dompu who came from outside their region. Although the farmers from Sumbawa had known the buyers from Dompu for a long time, they did not practice delayed payment because they lived too far away to sort out problems with cattle payments if they occurred.

In brief, trust played an important role in cattle and meat marketing in the Local case. It was embedded in the relationship among actors (farmers, middlemen, butchers, and meat buyers) and led to long-lasting business relationships. The following section examines the role of social norms in cattle markets.

How social norms shape cattle supply, demand, price, and smallholder farmers' decisions on cattle. The orientation of the cattle-corn-seaweed (*sapi-jagung-rumput laut*, PIJAR) programme in NTB was a market-led programme which aimed to improve rural livelihoods. However, this study found that farmer's motivations for selling cattle in Dompu were not based on the market demand. Farmers usually invested in cattle as a form of savings. Farmers believed that cattle were a useful form of savings because they increased in value through breeding and physical growth. Farmers also believed that cattle could be sold at any time if they needed money, because there were a large number of *pelele* (middlemen) in the village who were always looking for cattle to buy. However, farmers did not sell their cattle when demand and prices were high (such as during the Eid celebration days). Rather, they sold their cattle when they needed a large amount of money for an emergency or for religious and traditional ceremonies.

The highest demand for beef was usually during Eid al-Fitr, a religious ceremony, and, during the Eid al-Adha season, the demand for live cattle was high. At the time of Eid al-Fitr celebration, Moslems invited families and relatives to enjoy food at their houses and served beef as the main meal. Hence, the demand for meat was very high and slaughterhouses in Dompu normally killed 10-12 cattle per day. In contrast, during the Eid al-Adha season, some people slaughtered live cattle as part of a celebratory ritual. They bought live cattle from farmers and slaughtered them at their houses or at the local mosque. However, in later years, this practice had changed and many Moslems in Dompu brought the live cattle to slaughterhouses because they preferred to obtain beef that was processed and packaged into various cuts. The packages of beef were then distributed to their family and relatives and the poor.

The sourcing of cattle by meat buyers during the two festivals was difficult because not many farmers were willing to sell their cattle during these periods. As explained above, the farmers did not sell their cattle unless they needed cash, and the times of needing

the money was different among farmers. Therefore, the price of cattle during these two seasons was high but, despite this, farmers tended not to sell their cattle. The exception was when festive seasons²³ coincided with the growing season for maize when farmers require cash to pay for inputs to plant their corn crops.

The largest number of cattle that were sold was during the corn-planting season every year to fund the planting of the crop. *“Many people sell [their cattle] to start crop planting.” (Mr. Tarumanegara, line 175).* Farmers sold their cattle to obtain money to buy inputs and pay for labourers to plant and then later harvest their corn crops. During the corn-planting season, the price of cattle usually fell, because the supply of cattle on the local market exceeded demand. The farmers’ practice of selling their cattle during the corn-planting season reduced their bargaining power. The farmers needed money immediately to sow their crops and the middlemen knew this. Thus, middlemen had greater bargaining power than the farmers and could offer them a lower price. The farmers shopped around to obtain the best price from the middlemen.

In summary, despite the introduction of formal institutions such as cattle grants, free vaccination and healthcare, and building physical markets, the Government failed to encourage farmers to be more market-led in their cattle farming. This is because farmers still considered cattle as a source of saving or investment rather than as a source of regular income. Farmers had not changed in response to the programme; they still sold cattle when they needed cash rather than obtain a high price.

6.3.3. Summary of the Local case

The **vulnerability contexts** that shaped smallholder farmers’ decisions in the Local case were relatively the same as the Transmigratory case. Those were the development trends, seasonality and shocks. The local government was more focused on corn and rice development and the crop farmers in the Local case viewed cattle as a means for saving including selling cattle to support crop farming.

²³ The date for the seasons of the religious celebrations uses a lunar calendar instead of a solar calendar. Hence, the crop-growing season sometimes occur the same as the religious celebration seasons.

Shocks were the vulnerability context that shaped smallholder farmers' decisions on selling or retaining their cattle. As cattle were a means of saving and insurance, the farmers would sell their cattle when they were in emergency situations where they required high amount of cash. The farmers also needed to be economically secure so that they had mixed income activities in agricultural or non-agricultural sectors. Hence, access to and ownership of mixed **assets** was also important in doing different income activities. As most smallholder farmers were crop farmers, access to or ownership of farmland (natural capital) and sources of financial capital were important. Social norms also shaped smallholder decisions on slaughtering or selling cattle, especially for religious or traditional ceremonies (**informal institutions**).

The role of formal and informal institutions played out in shaping crop farmers' decisions on their cattle. Access to crop input grants or subsidy, and access to formal and informal credits also affected the decisions. The ability to access the grants or credits helped them to reduce costs of crop farming and retain cattle because cattle were usually used to cover the cost of farming. Banks and pawn shops were the form of formal credits. Borrowing money from money lenders was the informal institution that was commonly used among people in the society because they did not have to provide collateral and complicated administration, even though the interest was high.

Seasonality is another vulnerability context that played out in shaping the interactions between crops and cattle. During the crop growing season, cattle farmers lacked access to forage and labour. However, the grazing system was a common practice (**social norm**) among the farmers in their society. Hence, they had an alternative way of farming their cattle. Farmers, especially those who were willing to travel to the common grazing land, could farm their cattle seasonally during the crop growing season. Some of them also grazed their cattle over the whole year. However, female-headed households could not travel to the grazing area because travelling far away was not appropriate for them (**gender norm**). This kind of **informal institution** shaped the number of cattle the farmers could have. Specific to the women-headed households, they needed to keep the number of their cattle small. The smallholder farmers who grazed their cattle could keep as many cattle as possible, while those who did not send their cattle to the grazing land needed to deal with limited access to forage and labour. The shared farming

system (*kadas-in*) was an option for the people (**informal institution**) who faced different issues when investing in cattle, such as lack of labour or increasing the number of cattle without buying cattle. Shared cattle farming was not as preferable as among the farmers in the Transmigratory case because cattle owners might keep their cattle in the grazing area when they faced labour problems.

Similar to the Transmigratory case, the smallholder farmers in the Local case were also not market-led in farming cattle. They raised cattle primarily for a means of saving or saving insurance. They sold their cattle when they needed cash. Moreover, they were not stimulated to sell their cattle because of high prices or demand of markets, except for their need of a high amount of cash. The farmers preferred to sell their cattle at the farm gate or their house instead of taking their cattle to the buyers' house. The price of cattle was not based on the formal information from the Government; rather, it was based on the physical appearance of the cattle, personal skill in predicting price, and individual bargaining skill.

6.4. Summary of the findings chapter

Management of cattle in both cases in this study include various decisions which smallholder farmers made relating to their cattle. Those include decisions on increasing the number of cattle such as buying or retaining cattle, and producing calves. They also included reducing the number of cattle through selling, slaughtering and giving away. Those are also related to cattle management practices including nutrition, healthcare, labour, and marketing cattle. The findings of this study were examined and analysed by using the Sustainable Livelihoods framework. However, the components of the framework cannot be written in a tidy structure because they are complex, interrelated and interconnected. From the findings presented above, here is the summary of the role of mixed livelihoods in shaping management of cattle in the Transmigratory and Local cases. This summary also includes some similarities and differences between the cases.

The study provides examples of the roles of mixed aspects of sustainable livelihoods in shaping smallholder farmers' decisions on their cattle. First, the decisions on increasing the number of cattle (buying, acquiring, or retaining cattle) were shaped by **livelihood outcomes** or livelihood portfolio of smallholder farmers. When the smallholder farmers

in both cases could increase their livelihood portfolios and were economically secure, they had greater ability to invest in cattle. The opportunity to invest in cattle could be increased when the smallholder farmers did not experience economic shocks or stresses (**vulnerability context**). The farmers in both cases usually preferred to invest in productive assets for saving, such as small or large livestock, or the assets that had increasing value such as gold. They bought cattle when they had enough cash from accumulating smaller means of saving (small livestock or gold).

Second, shocks are a form of **vulnerability context** in livelihoods that shaped the farmers' decisions on reducing the number of cattle. The smallholder farmers in both cases sold cattle when they were facing shocks. Shocks here refer to the conditions when smallholders face emergencies. For example, the farmers sold cattle when family members were sick and they needed cash for health treatment, or when crops had failed. Cattle were the asset to be sold when the smallholders needed cash, but the cash or the more liquid assets other than cattle, did not meet the amount of cash needed by the farmers.

In the broader system, **informal institutions** regarding religious and cultural ceremonies shaped smallholder farmers' decisions on selling or slaughtering cattle. For religious ceremonies such as Eid Adha, people slaughtered male cattle (above a year) or any cattle were sold for weddings or other religious celebrations.

Third, **livelihood strategies** that shaped decisions on buying cattle were related to mixed (diversification) income sources. The diversification of income sources included agricultural and non-agricultural activities. These mixed activities were the strategies to enable the smallholder farmers to fulfil their regular needs as well as to save some of their incomes. They could buy cattle when they earned a high amount of income (e.g. successful cropping and selling crop yield).

Fourth, development trend was another **vulnerability** context which shaped a range of smallholder farmers' decisions on cattle. The local government provided the largest support to corn development compared to other commodities, to which smallholder farmers responded positively. Hence, allocation of several **assets** such as human capital (labour), finance and farmland were mostly allocated for growing crops instead of for

farming cattle. This was especially the situation when cattle were not a primary source of income but were a form of financial capital. The smallholder farmers might sell their cattle when they did not receive grants which could support them to reduce the cost of growing crops. The farmers could also sell cattle when they did not have access to credits which provided them with financial support during the crop-growing season.

Conversely, smallholder farmers might keep their cattle from being sold when they had enough cash or more liquid assets than cattle. The decision was influenced by both **formal** and **informal institutions**. Cattle could be retained when smallholder farmers could access credits or grants. Those are whether from banks (formal institutions), pawn shops (formal institutions), informal money lenders (informal institution), or from non-cattle development programmes (e.g. inputs for growing crops, free health insurance for people, social supports, etc.). These formal institutions helped smallholder farmers to retain their cattle as, basically, they were reluctant to sell their cattle unless they did not have cash or more liquid assets than cattle.

Specific to cattle development initiatives, the smallholder farmers in both cases could acquire cattle through formal institutions such as accessing cattle grants. However, accessing the grants was not easy for many smallholder farmers because those were limited to the livestock farmer group members. Moreover, not all farmers were able to join the group, especially if they were not part of the livestock farmer networks. For woman-headed households, in particular, they were often excluded from the livestock farmer groups which were dominated by men-headed households (**gender norm**).

Apart from the primary role as a means for saving, this study demonstrates the role of the availability of human and natural capital (e.g. labour and forage) in shaping decisions around selling, retaining, or increasing cattle (**livelihood assets**). In the case of the smallholder farmers who did not graze their cattle the whole year, they sold some of the cattle when the number exceeded the capacity (labour and forage) to keep them. **Seasonality** was the vulnerability context that shaped this decision. During the food crop growing season, the smallholder farmers lacked access to forage and availability of labour and, therefore, they were forced to sell their cattle.

In both cases in this study, a shared farming system might increase the opportunity to increase the number of cattle and to overcome the lack of labour in farming cattle. In this context, this is categorised as **informal institution** as the shared farming system is a trust and informal-based agreement. The smallholder farmers who could not buy cattle had a traditional way to acquire cattle which is called *kadas* system. *Kadas* is an informal agreement between cattle owners and keepers based on trust. For smallholder farmers who wanted to acquire cattle but did not have enough money, they could keep (*kadas in*) other people's cattle. That was also beneficial for cattle owners who wanted to keep or invest in cattle but did not have enough labour. The cattle owners could *kadas* out their cattle.

In terms of cattle production, healthcare, administration and labour, smallholder farmers' decisions were shaped by a complex of smallholder farmer livelihoods. **Social norms** shape the strategies to deal with limited access to forage and labour in particular seasons. The Transmigratory and the Local cases had different practices for dealing with limited forage and labour. The smallholder farmers in the Transmigratory case did not send their cattle to the grazing area, while grazing cattle in the main grazing land was a common practice among smallholder farmers in the Local case. Therefore, the smallholder farmers in the Local case tended to keep the number of their cattle unlimited. On the other hand, the farmers in the Transmigratory case were inclined to reduce the number of cattle by selling some when it exceeded the availability forage and labour. However, the women cattle farmers, in both cases, decided to sell some of their cattle when the number exceeded the capacity to raise cattle for different reason. In both cases, the societies viewed women travelling too far from the house to collect fodder or to graze cattle was inappropriate.

The other **formal institution** was related to the cattle health and administration. It was identified in both cases that the smallholder farmers had different responses to government services for cattle. In the Transmigratory case, the smallholder farmers used the animal healthcare services including AI because they raised their cattle intensively rather than grazing them (**social norm**). However, the farmers did not commonly apply for cattle cards (administration) because they considered having cattle cards was not necessary; they believed that they were only needed by those who had to

travel to transport their cattle away. On the other hand, the smallholder farmers in the Local case used the card-making services and vaccination more than the farmers in the other case. As a main requirement, they needed the cards to enter or to leave the grazing land. Moreover, a vaccination was required when applying the cattle cards. They did not use the healthcare and AI as intensively as the Transmigratory case.

In terms of markets, the smallholder cattle farmers in both cases were not market-led. They were not mainly attracted by the demand or price of market to make them sell their cattle because cattle were not a regular source of income. Cattle were sold based on the farmers' need of cash. When reducing cattle, several additional conditions were applied. First, types of cattle that were prioritised to be sold were bulls or less productive cows as it was common among the farmers in the society to prefer reproduction to fattening. Hence, productive cows were kept to gain calves. Second, cattle could be slaughtered when the cattle were sick or injured. However, injured cattle could also be sold to slaughter houses.

Chapter 7: Cross case analysis

7.1. Introduction

The previous chapter described the two cases (the Transmigratory and the Local) and identified the factors that influenced the farmers' management of cattle in each case. This chapter reports the results of the cross-case analysis where the results from the two case studies are compared and contrasted from the perspective of the sustainable livelihoods. To help the reader understand the reasons for the differences and similarities between the cases, in terms of the farmers' cattle management, the important characteristics of the two case studies are set out in section 7.2. In section 7.3, the key findings from the cross-case analysis are reported. This section includes factors that shaped farmers' decisions around ownership, purchase, and selling cattle. This section also covers factors that influenced healthcare and mating decisions as well as the influence of development interventions on farmers' decisions on their cattle.

7.2. Comparisons of the livelihood characteristics of smallholder farmers in the Transmigratory and Local cases

The important characteristics of the two cases are presented in this section. The smallholder farmers in the first case are the people from Lombok Island whose first generation moved into the area in 1972. The smallholder farmers in the second case are the local people from Dompu who have farmed in the region for generations. Therefore, there are cultural differences in these two cases which include different behaviour and values relating to farming practices, and different social norms. The farmers in the two cases follow the same religion which is Islam, and they have similar levels of education ranging from non-formal education to undergraduate level. The levels of study are from 'did not take any formal education' to 'finished primary school level'. Very few of the smallholder farmers in this study have achieved at undergraduate level (maximum two in each case). The majority of the people in both cases are smallholder farmers. The average farm sizes between the two cases are different. In the Transmigratory case, it is

around two hectares, while the average size in the Local case is around one hectare. The average household comprises four people in both cases, yet, there are few households with extended family (parents live with their children, children in laws, and grandchildren). The following sections describe other important characteristics of the two cases in relation to the sustainable livelihoods framework which influence the cattle management of the farmers in the two case studies. These characteristics are described under the headings: vulnerability context, livelihood assets, institutions, and livelihood activities.

7.2.1. *Vulnerability context*

In terms of the vulnerability context, the farmers in both cases had to deal with seasonality with both regions having a wet season and a dry season that dictate what crops they can grow and when. The development trend is also another vulnerability context with which the smallholder farmers in both cases need to deal. The corn development initiative that has intensified the use of farmland, especially during the wet season, has been responded to positively by the majority of the farmers in the district in both cases. The vulnerability contexts had important implications for cattle management and these are covered in the section of factors that shape smallholder farmers decisions on their cattle (Section 7.3).

7.2.2. *Livelihood assets*

A number of livelihood assets were important in influencing farmers' management of cattle across the two case studies. This sub-section highlights the livelihood assets which influenced the cattle management of the farmers in the two case studies and sets these out under the headings of: natural capital, physical capital, financial capital, social capital and human capital.

a. *Natural capital*

In terms of natural capital, access to land was important for the livelihoods of farmers in both cases. Access to land allowed farmers to grow crops for consumption and sale and the land was also a source of forage for cattle. It also influenced the farmers' access to

forage which, in turn, influenced their cattle management decisions. As mentioned before, the average farmland size differed between the two cases. In the Transmigratory case, it ranged from 0.35 hectare to 4.5 hectares of rain-fed land with different ways of accessing the land such as inheriting, purchasing, and leasing-in (Appendix D). However, the majority of the farmer households, in this case, owned land. Other than farmland, some smallholder farmer households also used their garden to grow rain-fed rice. The range of the garden was between 0.1 hectare and 0.75 hectares. On the other hand, a garden for growing rice was not available in the Local case (Appendix D). The range of farmland size was from 0.25 hectare to four hectares in the Local case, yet, the majority of the farmer households have less than a hectare of farmland under their management. The ways of accessing land varied among the households; such as through purchasing, inheriting, leasing-in, and *garapping-in* (sharing farm between land owner and farmers). However, similar to the Transmigratory case, the majority of the farmer households in the Local case had their own land. In both cases, some households did not grow crops because they leased-out or share-farmed their land to other farmers, or because they lacked the financial capital to grow crops on their land. Only one household in the Local case had farmland, yet the family abandoned their land because the location was too far and had difficult vehicle access. Some households, in both cases, did not even have any farmland, and these households relied on non-crop types of activities for their livelihoods.

There was one important similarity and one difference between the cases in terms of access to land and forage. The similarity was that the farmers in both cases had the same access to any farmland in the village during non-crop growing season to graze their cattle. However, the farmers in the local case accessed common grazing land for their cattle in the mountains, whereas the farmers in the Transmigratory case did not access such grazing because of social norms associated with cattle management and risk. The land in both cases is mostly rain-fed and, the farmers had distinctive wet and dry seasons which dictated what crops could be grown and when.

b. Physical capital

Various types of physical capital were available for smallholder farmers, especially to support their livelihood activities. Infrastructure is a form of physical capital which is important in helping farmers with their farming activities, including cattle farming. The essential infrastructures for cattle farming that could be accessed by the farmers were veterinary healthcare services available in each sub-district. The staff also could be contacted and asked to come to the farm for healthcare or breeding services (see the sections 7.3.4 and 7.3.5). There were livestock market yards provided by the local government, yet, they were later abandoned as the farmers preferred not to market their cattle there (see the section 7.3.3).

For crop farming, several important infrastructures were available in both cases. They were mainly available in the sub-district level, yet, they could be accessed relatively easily by the farmers in both cases. The infrastructures were crop farming extension offices, banks, pawn shops, roads that connected between farms and the main roads, and wet markets. Moreover, vehicles were also important physical capital for the farmers. Private vehicles, such as cars and motorcycles, were preferred to support people's mobility as they were more flexible than public transport. In terms of communication services, the farmers in both cases have used mobile phones for communication. The Government had realized the importance of the communication system in the agricultural sector so communication infrastructures were built and covered the area of the two cases. The infrastructures were important in supporting economic activities of farmers who mostly relied on crop farming.

To some degree, physical capital was used by farmers in both cases to overcome the limitations of the natural capital in relation to seasonality. Farmers in the Transmigratory case stored rainwater so that they could grow a crop of rice for consumption purposes. In contrast, the Government developed irrigation systems for the farmers in the Local case so that they could grow two to three crops of rice per year.

c. Financial capital

In terms of financial capital, the farmers in both cases used a combination of formal and informal credit along with savings to support their livelihoods. This credit might be used for consumption or to fund productive activities such as crop-growing. The households in both cases could access formal credit through loans from banks and input suppliers. They could also access informal credit through relatives, or money lenders (*rentenir*). The sources of credit preferred by households differed between the two cases. Formal credit from banks was more common in the Transmigratory case because it was a pioneer for the corn farming development initiative by the Government and, as part of this, farmers were encouraged to use sources of formal credit. In contrast, the farmers of the Local case tended to use informal sources of credit such as relatives and money lenders (*rentenirs*).

Farmers in both cases also invested surplus cash into different types of liquid assets as a form of savings. These assets could be liquidated quickly to provide cash for consumption or productive purposes. The same types of liquid assets were used in both cases of this study and included gold, poultry, goats and cattle. Gold tended to be used by women as a form of savings and it was worn as jewellery. Some farmers preferred to invest in small livestock (poultry and goats) as a form of savings because they could reproduce and increase in value. In both cases, the majority of farmers used stored rice and beans surplus to consumption requirements as a form of savings. Farmers in both cases used cattle as a form of savings and these were only liquidated for large expenses such as to pay for their children's education or to fund a family wedding celebration. In contrast, gold, smaller livestock, and rice and beans were liquidated to cover the cost of smaller expenses.

In terms of keeping cattle, the number of cattle managed by farmers in both cases was different (see Appendices D and E). The farmers in the Transmigratory case kept up to 15 cattle, while the farmers in the Local case had 34 cattle beasts. The cattle were owned by the farmers, while some of them kept other people's cattle (shared farm). The farmers in both cases had a different capacity for keeping cattle because of the

availability of resources such as labour and forage, which were shaped by the social practices in keeping cattle. This is explained in section 7.3 below.

d. Social capital

An important difference existed between the Transmigratory and Local cases in relation to social capital. Social capital was important for farmers in both cases when they grazed their cattle in the village during a non-crop growing season, and especially for the Local case that grazed their cattle on common land in the mountains. For the farmers in the Local case who grazed their cattle in the main grazing area, they worked together to fund the transportation of the cattle to the grazing land. Farmers were also expected to take turns at looking after the group's cattle while they were away grazing.

Social capital to support farmers in their farming activities in both cases was related to the formation of a farmer's association. Rural development initiatives related to agricultural sectors were usually implemented through these associations. The network with other farmers in their society provided more opportunity for all the cattle farmers to join a farmers' group. In a farmers' association, the opportunity was not only to get grants or assistance for the farmers, but to also obtain important information for their farming activities. It differed from the crop farmer associations; social capital was not an important factor which enabled a farmer to join a group because the associations were mainly formed and monitored by the central Government. Moreover, the data of the crop farmers were updated by the Government. The dynamics around these groups are explained further in section 7.3.

e. Human Capital

Labour is an important human capital for people's livelihoods in both cases. This study found that access to labour shaped smallholder farmers' cattle farming, especially to collect fodder and feed cattle. Often there was competition for labour between the different livelihood activities. In these situations, key income-earning activities such as corn farming, took priority over cattle farming. Labour was limited in women-headed households (WHHs), and households, especially in the Transmigratory case, where family members were working as migrant labour. In the Local case, farmers placed a

strong emphasis on higher education so that their young people could work in non-agricultural sectors. However, such aspirations reduced the amount of labour on their farms.

In terms of cattle farming, this study did not find any particular capacity-building activities provided for farmers to increase their ability to farm cattle. The farmers in each case relied on their personal efforts to learn from their own experiences or from other farmers on how to farm cattle.

7.2.3. *Institutions*

Important similarities and differences were identified between the institutions within the two case studies. This section covers the formal institutions that influenced the cattle management of the farmers in the two cases and then describes the informal institutions (traditions, social norms) which were important in the two cases in relation to cattle management.

a. Formal institutions

A number of formal institutions influenced the management of cattle in both cases. The description of formal institutions is presented in this section, and more detail about how formal institutions shaped management of cattle are explained later on in section 7.3. In terms of crop farming, the Government introduced a corn policy in Dompou district to promote corn production, and corn farming has been adopted and accepted widely by most farmers in both cases. The growing of corn during the wet season has had a number of impacts on cattle management in both cases. In the Transmigratory case, because it was a pilot area for the corn policy, the use of formal credit to fund corn growing was promoted to farmers and this has seen a high uptake of formal credit by farmers. This did not happen as widely in the Local case because the introduction of supports for corn farmers in the Local case had started much later. With the uptake of corn farming, another formal regulation was introduced into both cases to prohibit the grazing of cattle in the village during the wet season. This impacted on smallholders' decisions on their cattle, which farmers had to keep their cattle away from the farmland.

b. Informal institutions

Informal institutions played an important role in the management of cattle in both case studies. *Kadas* is an informal share-farming system which is found in both cases. An agreement is made between farmers who will manage the cattle and farmers who own cattle. It allows smallholder farmers to build up wealth and the existing cattle farmers to increase their cattle numbers. Wedding traditions also had an important influence on smallholder farmers' decisions regarding their cattle farming in both cases. Providing cattle as a dowry in a wedding, selling cattle to fund a wedding, or slaughtering cattle to provide food for people in a wedding were common practices. Therefore, one of the reasons for keeping cattle for farmer households in both cases was to save their wealth through cattle to fulfil the need for future weddings of their family members.

Social norms also influence the management of cattle in both cases (this is explained in more detail in section 7.3). The most important social norm in relation to cattle management is that farmers in both cases view cattle as a form of savings. Related to this, the farmers have a set of informal rules which dictate what assets they liquidate when they require cash for their livelihood needs. Both cases have a patriarchal society and, as such, there are gender norms that dictate women's roles in public life. This has a number of implications for the management of cattle by women. As mentioned earlier, social capital is important in relation to the grazing of cattle on common land where farmers work together to graze their cattle. The social norm of reciprocity is important here because farmers must take their turn in looking after the group's cattle.

In both cases, when farmers sold cattle, the regulations (Formal institution) stated that those cattle should have a cattle card. The farmers in both cases had different views on the importance of the cattle cards. For the farmers in the Local case, they applied for cattle cards because they needed them to transport their cattle to the main grazing land. The farmers could bring their cattle out of the grazing land later on if they had a card for each of their beasts. Farmers had to show the card to the government officer who checked and monitored the traffic of cattle at the gate of the grazing land. On the other hand, in the Transmigratory case, cattle cards were not considered important because they did not transport their cattle outside of the village. The ones who needed the cards

were the traders who bought the cattle from them and brought them out of the village. An unwritten agreement between farmers and traders was that the middlemen would organise the cattle card for the farmers when they bought their cattle. Similarly, in the cattle marketing system for both cases, there are social norms around the delayed payment for cattle where the farmers and the middlemen made an unwritten agreement that the farmers could be paid for their cattle after the middlemen had on-sold them.

7.2.4. *Livelihood Activities*

The farmers in both cases undertook similar livelihood activities which can be separated into farming and alternative livelihood activities. The farming livelihood activities can be separated into cropping activities and livestock activities. These are described in the following sections.

a. Cropping activities

Rice is the staple food in both case studies. Farmers grew rice on the wet or irrigated land. Farmers in the Transmigratory case could grow one crop of rice if they store rain water for rice cultivation. Although the Transmigratory farmers had a social norm about growing rice for household consumption, many farmers in the Transmigratory case did not have sufficient land to grow rice due to population growth and a preference for growing corn for income. Instead, they used income from corn sales or other income-earning activities to buy and store rice for household consumption. Farmers in the Local case with irrigation could grow two to three crops of rice per year. In a dry year, they might grow two crops of rice and a crop of beans (soya, mung) or peanuts. The other farmers in the Local case who did not have irrigation will grow corn and use the income from corn to buy and store rice for household consumption.

b. Livestock activities

For both cases, farmers run a mix of livestock activities that comprise poultry, goats and cattle. Poorer farmers would run less expensive livestock such as poultry and goats, whereas wealthier farmers would also have cattle. Poorer farmers might share-farm (*kadas*) cattle with a cattle owner as a way of increasing their wealth. Livestock farming

is not the main income activity for the farmers in both cases. This is related to the function of cattle as a means of saving rather than as a regular source of income. The implication to the distribution of labour was its focus on crop-farming activities rather than the livestock farming activity. Livestock farmers usually used family labour to farm their livestock, and hiring professional labour was not common. Shared-farming (*kadasing-out*) of cattle was an important strategy for cattle owners to deal with a lack of labour while they intended to keep investing in cattle or to increase the number of cattle ownership. Share-farming, or *kadas* system, is an informal arrangement which was common in both cases rather than hiring labour.

c. Alternative livelihood activities

The majority of the farmers, in both cases, who owned, leased-in, or share-farmed land, grew crops. The farmers who did not grow crops because they leased-out or share-farmed land, lacked financial support to grow crops on their land or did not have land, undertook alternative livelihood activities. There were similarities and differences of the types of alternative income activities outside of farming activities undertaken by the cattle farmers in both cases. Working as crop farm labourers was a preferred choice to earn income on a daily base. Few of the farmers in the Transmigratory case did brickmaking, yet it was quite common in the Local case to earn income from making and selling bricks outside of their time to do crop farming. Some farmers in the Local case also did bamboo-screen making, or provided a taxi service outside of their routines of keeping cattle. In the Transmigratory case, some farmers set up a grocery or food vending services, and some left the region to work as migrant labourers.

This study found that, for both cases, the wealth of households influenced the types of alternative livelihood activities which were undertaken. Households that were poor, or had low education, had limited, or no farmland, tended to work as labourers to generate daily income. In contrast, the better-off households tended not to work as labourers. Rather, they undertook more entrepreneurial livelihood activities such as brick making, bamboo screen making, running a small grocery shop or food vending service, or providing a motorcycle taxi service (*ojek*). These activities provided regular, (daily) but small amounts of income which was normally used for consumption purposes. This

income was important, especially for crop farmers, as it helped them meet their consumption needs while waiting for the harvesting season.

The mix of livelihood activities and when they did these depended upon the context such as the season (wet or dry seasons). In the Transmigratory case, the farmers mainly worked on farms and also worked as farm labourers on other farmers' farms on the days they did not work on their own. For the farmers who did not grow crops during the wet season because they lacked the funds to grow crops, they would raise their cattle, make bricks for sale or do other small or no cost activities. Some of these farmers also worked as on-farm or off-farm labourers. These farmers also focused on their small livestock (poultry) as a means of saving to fulfil the need for consumption, for example, poultry was sold when the farmers needed cash to buy food. During the dry season, the farmers in the Transmigratory case mainly focused on their livestock farming, particularly their cattle. They also undertook alternative livelihood activities such as brickmaking for sale, or doing non-farm labour. For those who had more financial support, they could engage in larger business such as being vegetable vendors who travelled around the village and other villages to sell their produce because they had more time to do these activities while grazing their cattle in the village. In the Local case, during the wet season, the farmers were growing crops and working as local labourers. However, they had more time to do brick making and bamboo screen making if they sent their cattle to the common grazing area. During the dry season, the farmers in the Local case had more time to undertake these alternative activities while looking after their cattle.

7.3. A cross-case comparison of the factors that shaped farmers' decisions in relation to cattle management

The following sections compare the factors that influenced farmers' decisions in relation to cattle management across the two cases. Similarities and differences between the cases are highlighted and contextual factors related to the livelihood framework are used to explain the findings. The section is divided into six sub-sections. Section 7.3.1 describes the factors that influence farmers' decisions to own or purchase cattle. Section 7.3.2 explains the factors that shape farmers' decisions in relation to the

number of cattle they kept. Section 7.3.3 provides comparisons of factors which influenced the farmers' decisions to sell cattle between the two cases. Section 7.3.4 presents the factors that influence farmers' decisions of healthcare. Section 7.3.5 describes the factors that influence farmers' decisions about cattle-mating. It is then followed by a description in sub-section 7.3.6 of the influence of cattle development interventions on smallholder farmers' decisions on their cattle.

7.3.1. *The factors that influence farmers' decisions to own or purchase cattle*

It was found that farmers' decisions to own cattle were influenced by both formal and informal institutions and the farmers' livelihood assets (Figure 7.1). This was common across both case studies. The primary driver for farmers to own cattle was a prevailing social norm (informal institution) which was found in both communities. Cattle were viewed as an important form of savings in these communities rather than as a productive asset. Accordingly, the majority of farmers in both communities owned cattle as an important form of savings. The other advantage of cattle as a form of savings, compared to, for example, gold, was that female cattle produced calves, so the value of the asset increased over time. This form of savings was critical for meeting large expense items such as the education of their children, the provision of inputs for crop production, the purchase of land, and the cost of family weddings. This is explained in more detail in section 7.3.3 that is about the reasons to sell cattle. Traditions, another form of informal institution, also influenced this social norm because traditionally cattle were given directly or sold to provide a dowry for the bride. Cattle were also slaughtered to provide meat for the wedding celebration. Related to a religious norm, male cattle were slaughtered as a part of celebrating an Islamic festival (Eid Adha).

Central to the ownership of cattle is access to land (Figure 7.1). To own cattle, farmers needed access to land, because it provided them with access to the forage that they needed to feed their cattle. Land is a livelihood asset and a form of natural capital. Normally, the land that was accessed for forage was any land, whether the farmers' own land, other farmers' land, or common grazing land. The farmland was mostly available seasonally because it was mainly used for crop farming. During the wet season, it was

used for growing crops. The only land that could be accessed the whole year was the main grazing land. However, the Transmigratory farmers did not graze their cattle in the main grazing land for security reasons and it was the social norm on keeping cattle closed to their houses. On the other hand, the Local farmers who sent their cattle to the common grazing land usually kept their cattle there during food crop-growing season or in the wet season. The majority of the Local farmers who had a manageable number of cattle (around up to ten cattle) brought their cattle back and grazed them in the village during the dry season because, during this season, the main grazing land lacked forage crops (it is also rain-fed), and it was easier for the cattle farmers to look after their cattle near their houses.

The wealth of a farmer (Financial capital) was also important because many of the smaller and poorer farmers could not afford to buy cattle. When smallholder farmers, in both cases, were able to accumulate their wealth, there was an opportunity to invest in cattle as one of the means for savings. However, an informal institution, or agreement, helped a poorer farmer to overcome limitations in terms of wealth. The cattle shared-farming system enabled a poor farmer who lacked both land and capital to eventually own cattle. Cattle farmers who did not have enough labour and access to forage were then able to invest in cattle. The *kadas* system was an important livelihood strategy as well as informal institution for improving the livelihoods of poor farmers. This informal institution existed in both communities, although the share of the progeny differed across the cases because of differences in the way cattle were farmed in both cases. The cattle-keepers in the Transmigratory case farmed cattle more intensively (more labour intensive) than the Local keepers, which the farming practices in each case were related to a social norm in farming cattle. This included common practices between farmers in the two cases around grazing cattle and the way to deal with forage and labour as explained in Chapter 6. The rules of *kadas* agreement had become the social norm of each case. Hence, “the Transmigratory *kadas* system” and “the Local *kadas* system” were different. Although a keeper in the Local case did not farm their cattle in the main grazing land, the progeny of the *kadas* agreement within the Local case was the same. Information about the *Kadas* agreement in both cases is provided in more detail in subsection 7.3.2.

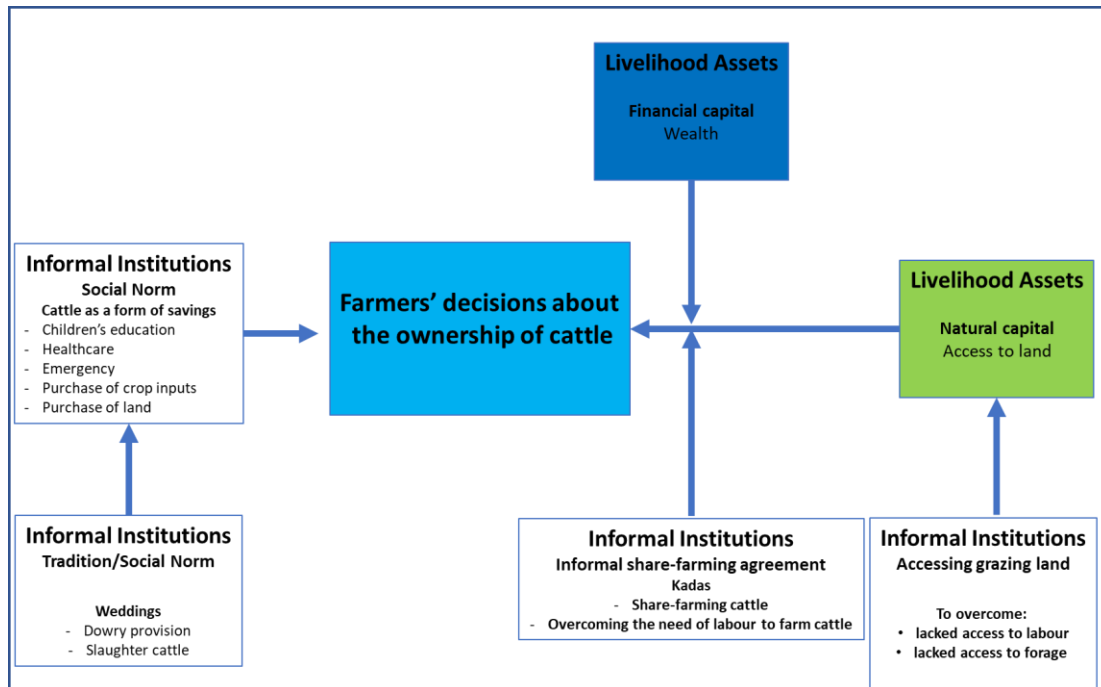


Figure 7. 1. The factors that influence farmers' decisions about cattle ownership

The methods of owning, or increasing the number of cattle, are summarised here (Figure 7.2). The farmers in both case studies purchased cattle and these farmers could be classified into two types. First, there were farmers who did not own cattle and they purchased cattle to provide themselves with another form of savings. This decision tended to occur when the farmers had sufficient funds, often in the form of easily liquidated assets such as small livestock, to purchase cattle. Second, there were farmers who already owned cattle, but wanted to purchase additional cattle, again, normally as a form of savings. This decision tended to happen when the farmers had surplus funds.

In the case of the first category of farmers, these farmers often purchased cattle as a form of savings to cover large future expenses such as the education of their children, family weddings and medical emergencies. The following quote provides an example of this and the process the farmer went through to be in a financial position to purchase cattle.

"I was thinking if I bought cattle, I could help my children to pursue their education. I thought that if I relied on crop yield, it would not be enough. Hence, I

decided to raise cattle before my children grow up. I started from raising chickens. I sold the chickens and bought goats. I sold the goats and I bought a buffalo. I then decided to raise cattle instead of buffaloes because cattle reproduce faster than buffaloes. You can gain a calf from a buffalo two in three years, yet, you can gain a calf every year.” (Mr Syaiful Yusuf, the Local case, line 190-197)

Farmers who did not own cattle could also obtain them through other means such as inheriting them, receiving them as a gift from their parents, or *kadas-out* their cattle or *kadas-in* other people’s cattle.

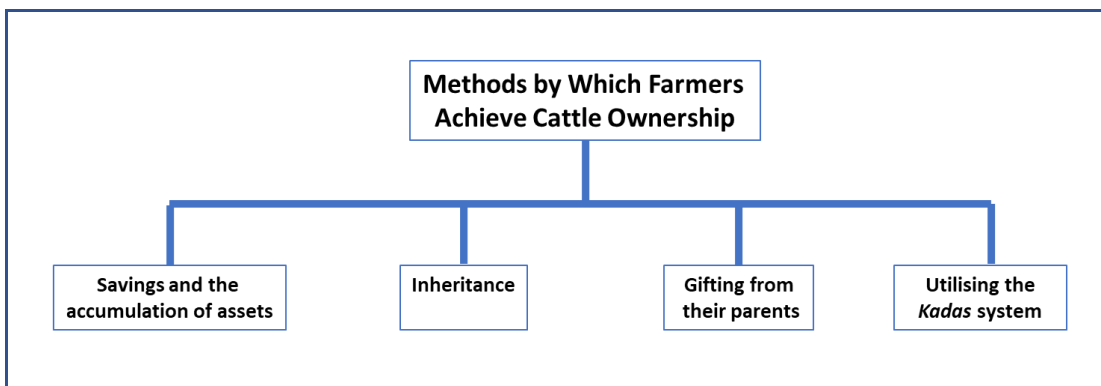


Figure 7. 2. The methods by which farmers achieve cattle ownership

The price of cattle in the local markets of both cases usually increased after the crop harvesting season as the demand for cattle was high during this period. Farmers sold their crops (corn and rice surplus to consumption requirements) and had surplus funds. Many of these farmers decided to invest their surplus funds in cattle rather than placing them in a bank.

The decision to invest surplus funds in cattle was also influenced by a number of other factors. For the farmers who had accessed credit (both formal and/or informal) to fund the growing of their crops, their first priority for surplus funds was to repay their loans. This is important for ensuring that trust was retained with their creditors. Failure to repay the loan could destroy trust and it was unlikely the farmer would obtain a loan from the creditor in the following season. This was particularly important where funds had been sourced from family and friends. Some of the farmers in the study had developed a strategy to cope with crop failure and to ensure that they could repay their

loan and ensure future access to credit. For example, one family ensured that they had sufficient cattle to cover the loan prior to applying for it from the bank.

Another reason farmers purchased cattle was to fatten and sell them just prior to the crop-growing season to provide funds for the cultivation of crops. This strategy was used by farmers in both cases. However, this was an optional practice. For example, in the Local case a man-headed household purchased small bulls several months before the start of the crop-growing season. The bulls were fattened and sold when the farmers needed money to plant their crops. The farmers chose bulls for fattening because they grow faster than female or castrated cattle. With the combination of a lower price and better rates of live weight gain, the farmers could make a good margin on the cattle they fattened.

Some WHHs sold the male cattle because they could not control the power of male cattle as articulated below:

“[actually] I want to [have male cattle again] but it needs a male labourer. Honestly, I am scared because they are so strong. They may hit you. I sold my male cattle beast some time ago although the price was low. I was scared because the bull stared at me. If I did not feed him soon, he would go berserk. But cows were calmer.” (Mrs Dita Pujiani, WHH, the Transmigratory case, line 958-961)

The women farmers were aware of the potential higher income from raising bulls because the growth of bulls was faster and the price was better. However, they needed manpower to handle the bulls. If they had teenage boys in their family, the women might be more confident to raise bulls. In fact, some women did not have manpower so they sold the bulls, even before the physical growth reached optimum size.

The decisions made by the smallholder farmers in this study were not only related to the ownership of cattle, but also regarding the decisions around the number of cattle they farmed. This is explained in section 7.3.2.

7.3.2. *Farmers' decisions around the number of cattle raised*

A complex range of factors influenced the number of cattle that were farmed by farmers in the two case studies (Figure 7.3). This included the vulnerability context, the mix of livelihood assets of the farmers, both formal and informal institutions and the mix of livelihood activities that the farmers undertook (Figure 7.3). The corn policy introduced into both case areas influenced farmers' adoption of corn farming for income generation. A large number of farmers in both cases adopted corn farming. The vulnerability context of the two cases was also important in relation to the corn policy because both cases were influenced by seasonality and corn could only be grown in the wet season. The growing of corn in the wet season influenced forage availability. Prior to the introduction of corn, cattle could freely graze in the village in the wet season and forage was plentiful. However, with the introduction of corn, cattle could not be freely grazed in the village because they damaged the corn crops. The corn crops also used up land that would have grown forage, and spray drift from the corn crops also made some of the forage toxic to cattle, further reducing forage availability.

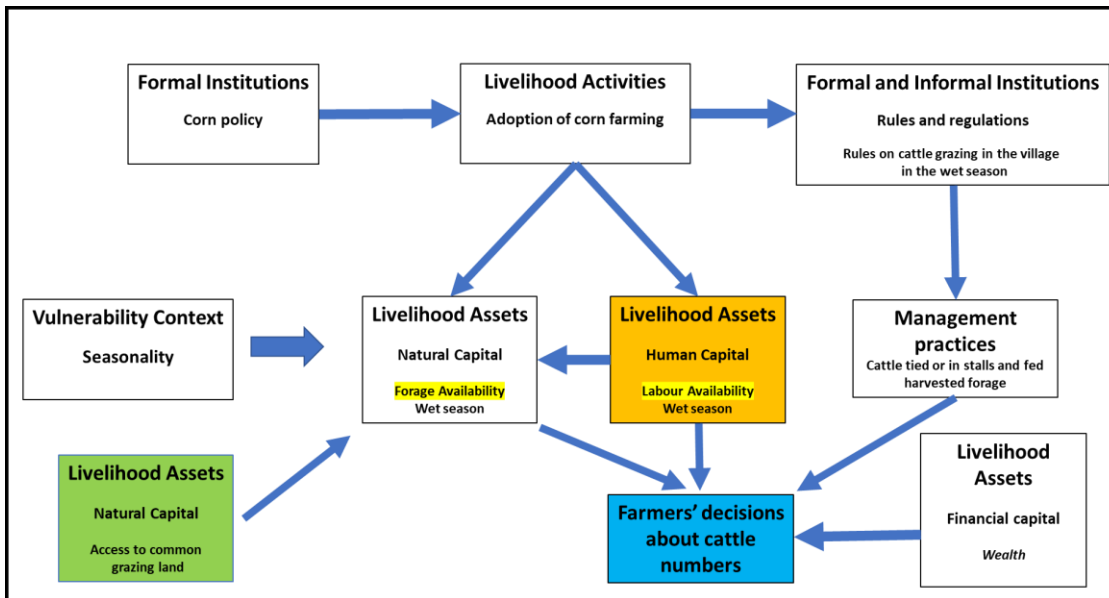


Figure 7. 3. The factors that influence the number of cattle a farmer runs

To prohibit the grazing of cattle in the villages during the wet season in both cases, the regency government had strengthened the existing informal rules among the societies

into formal regulations. The cattle had to be either tied up or placed in stalls and fed harvested forage, otherwise, the cattle farmers would be fined as well as receive social sanctions (Figure 7.3). Labour was required to harvest the forage, but because most of the farmers were growing corn during the wet season, labour availability was limited. The lack of labour, in turn, limited forage availability and this limited the number of cattle that a farmer could run. Similarly, the financial capital of a farmer also limited the number of cattle they could run. Poorer farmers could not afford to own large numbers of cattle.

An important difference between the cases that influenced the farmers' decisions about cattle numbers were related to social norms that affected access to common grazing land which, in turn, influenced the farmers' access to forage (Figure 7.4). The common grazing land could be accessed by all the farmers in the community and it existed in both cases. The common grazing land was some distance from the villages in both cases and this was important in relation to its use. Farmers in the Transmigratory case had strong social norms related to risk avoidance. The farmers did not like to leave their cattle in an area where they could not monitor them because there was the risk of injury or death. Therefore, the Transmigratory farmers did not use the common grazing land, and thus limited the number of cattle they could run. If the farmers' cattle numbers exceeded the number they could adequately feed from their pool of available forage, the Transmigratory farmers sold them and often used the money to purchase additional land, or increasing other assets such as buying vehicles or building a house.

In contrast to the Transmigratory farmers, farmers in the Local case had traditionally used common grazing land in the mountains. Access to common grazing land increased the Local farmers' access to forage during the wet season. Farmers transported their cattle to this area to take advantage of this forage source. Social capital played an important role in providing access to the forage resource on the common grazing land (Figure 7.3). The farmers worked together in groups to hire a truck to transport their cattle to the grazing area, reducing the transportation costs. The farmers also organised a roster so that farmers spent a period of time, each looking after the group's cattle at the common grazing land. The social norm around reciprocity was important in ensuring each farmer in the group took a turn at looking after the cattle. Farmers that

failed to do this were sanctioned by the group. Social norms also limited access to the common grazing land in the Local case, but this was a different social norm from that in the Transmigratory case. The Local case has a patriarchal society and there are strong gender norms which limit women’s involvement in various public activities (Figure 7.3). Women cannot travel far from their homes or they would be viewed negatively by their community. This prevented WHHs from taking advantage of the common grazing land. Accordingly, they could only run cattle in the village during the wet season and their cattle numbers were more limited by forage availability than farmers that could transport their cattle to the common grazing land.

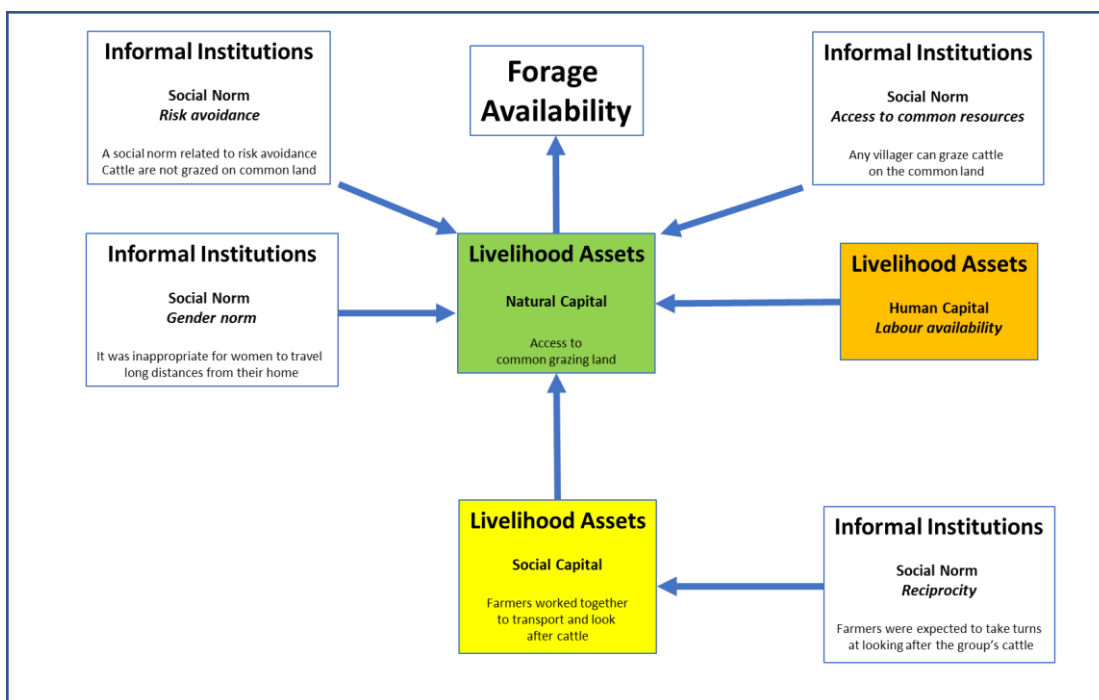


Figure 7. 4. Factors that influence access to common grazing land

The other limiting factor was labour availability during the wet season because farmers needed time to gather forage to feed their cattle (Figures 7.3 and 7.4). This was influenced by a number of factors including the livelihood activities the farmers undertook, and the formal institution of *kadas*, an agreement for the share-farming of cattle (Figure 7.4). The amount of time farmers had available for collecting forage

during the wet season depended upon whether or not they were growing food crops (rice and corn) and the mix of other livelihood activities (brick making, labouring etc.) they were undertaking during the wet season. Farmers that were not growing corn and, or rice, had more time to collect forage and could run more cattle. To overcome the problem of labour availability in the wet season, some farmers utilised an informal institution, *kadas*, where they share-farmed their cattle with a *pengkadas* or *cattle keeper* (Figure 7.4). The cattle keeper provided the labour to feed and look after the cattle in exchange for a share of the progeny. This strategy was used in both cases, but the proportion of progeny that was provided to the cattle keeper differed. In the Transmigratory case, the cattle keeper received a 50% share of the progeny whereas in the Local case, the cattle keeper only received a 33.3% share of the progeny. The reason for this difference in shares was shaped by a social norm as explained previously in section 7.3.1.

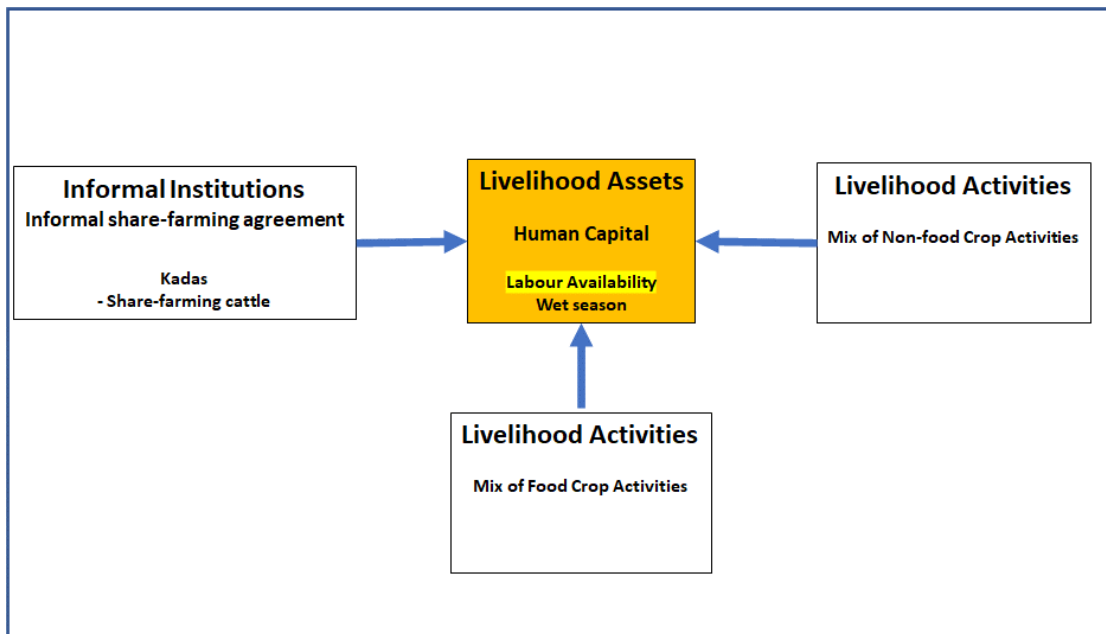


Figure 7. 5. Factors that influence the availability of labour

The other kinds of decisions in managing cattle enterprise in this study were related to selling cattle. Smallholder farmers' decisions to sell their cattle were shaped by several factors. This is explained in the next section.

7.3.3. *Factors that influenced the farmers' decisions to sell cattle*

A key decision faced by farmers was when to sell their cattle. As cattle acted as a form of savings, events that required the farmers to access funds were the prime determinants of when farmers sold their cattle. Funds are sourced from the sale of cattle for three main reasons: to support human development and social relations, to fund livelihood activities or to purchase assets (Figure 7.6). These reasons were mostly the same across both case studies, but differences did occur between farmers within the cases and this is explained in the following sections.

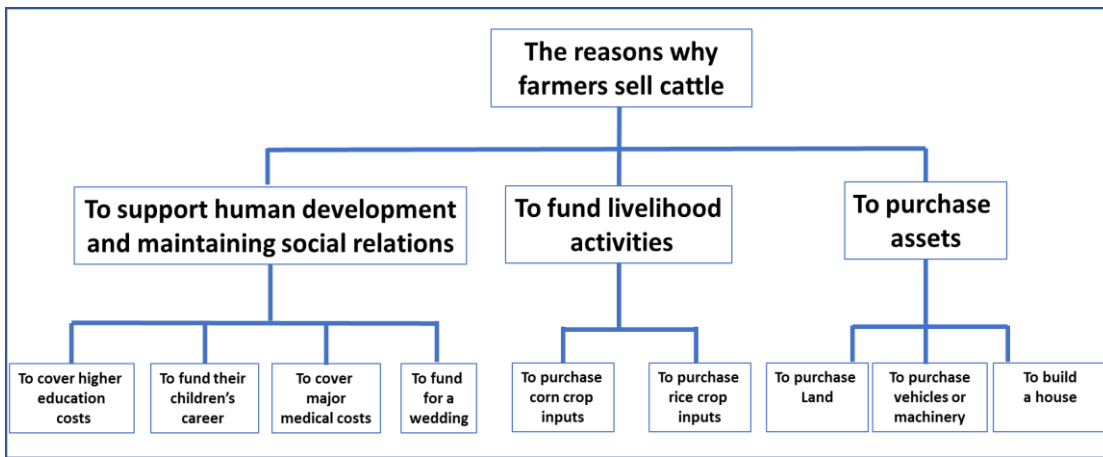


Figure 7. 6. Typologies of the reasons why farmers sell cattle sell their cattle

a. **The influence of the need to support human development and maintaining social relations on farmers' decisions to sell cattle**

As highlighted in the previous section, the need to support human development and maintaining social relations influenced farmers' decisions to sell cattle in both cases. Cattle were sold to fund large items (Figure 7.6). Farmers sold cattle when their children needed support to pursue higher education. The funds were used to cover tuition fees, and living expenses if they studied away from home. Furthermore, the farmers in the Local case supported their children to pursue an off-farm career such as to be a teacher, a soldier, or an officer in a government or private office. In this study, more farmers in the Local case invested in cattle for their children's education and career than in the Transmigratory case. More farmers in the Local case than those in the

Transmigratory case viewed that higher education and working in an office were more desirable than being a farmer. The farmers believed that farming was too difficult a life for their children, and they did not want to see their children undertake this career path as articulated by a farmer below:

“... no matter how heavy [the burden] is, my children have to study ... farming [or “tani” in the Local language] means heavy. I don’t want my children to experience how hard it is to be a farmer. Hence, I always think about how to support them to study.” (Mr Mahdali, the Local case, line 420 and 449-451)

Some cattle farmers in both cases sold their cattle in times of a crisis. Farmers sold their cattle, although the price dropped if the farmers needed a large amount of money. For example, cattle were sold when family members were sick or injured and they needed long-term or large treatments, or to be hospitalized.

Strong social norms around wedding traditions required that the parents funded the wedding celebration. For example, if a son was getting married, the parents needed to fund the wedding celebration. Cattle were normally sold, therefore, to meet the wedding costs of a farm household. Another strong social norm associated with wedding traditions was that the grooms and the parents were expected to pay a dowry for their brides. The dowry could be cash or cattle depending on the bride’s request to the groom.

b. The influence of the need to fund livelihood activities on farmers’ decisions to sell cattle

Most of the farmers in this study relied on food crop farming, especially rice and corn farming as their primary source of income. Investing in cattle was viewed as an important strategy to support their food crop farming in both cases. This was because farmers needed large amounts of cash to grow their crops. Cattle might be sold prior to crop planting to provide the funds for growing their crops and this included buying inputs, paying labourers, and supporting their daily consumption²⁴ for the whole wet

²⁴ The farmers could not choose to undertake as many other income-generating activities as in the non-crop farming season because they needed to focus on their crop farming.

season (Figure 7.7). If farmers were not growing food crops, and some farmers in both cases did not for various reasons, then they did not need to sell their cattle to fund the planting of food crops.

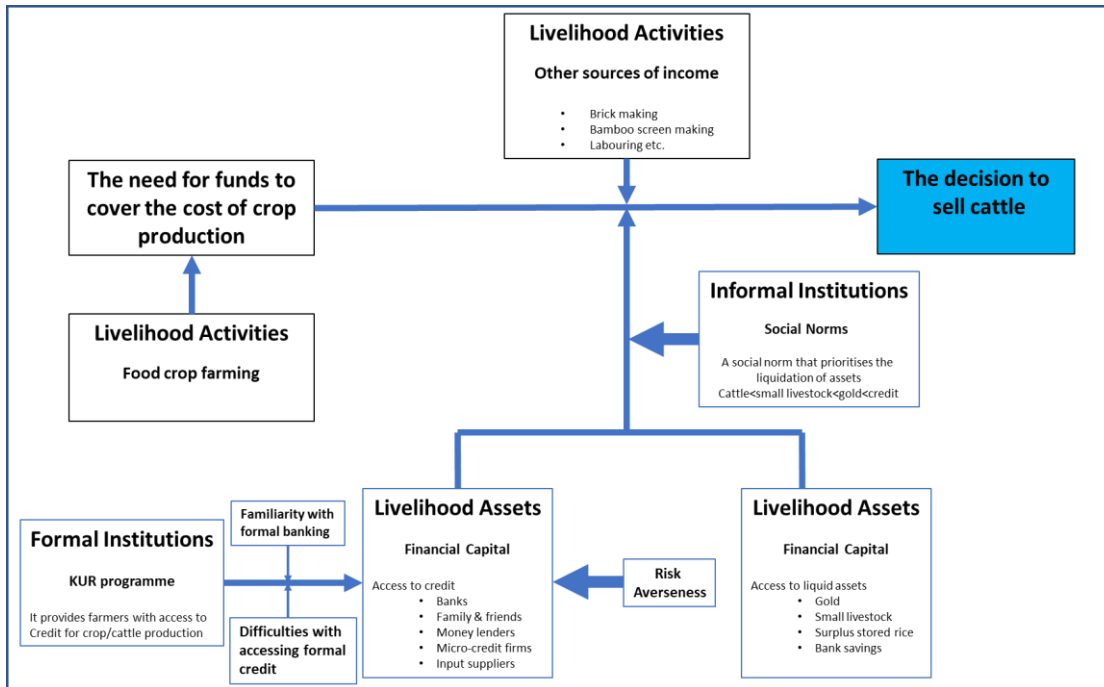


Figure 7. 7. How livelihood activities influenced farmers' decisions to sell cattle

For farmers who were growing food crops, the need to sell cattle, the timing of those sales and the number of cattle they sold also depended upon what other livelihood activities they undertook over the wet season as well as their financial capital in terms of access to credit and access to liquid assets (Figure 7.7). Thus, the farmers did not always sell their cattle at the start of the crop season. This depended upon the farmers' access to funds. The farmers tended to use credit facilities first to fund the growing of their food crops. Here, there were important differences between the cases. The farmers from the Transmigratory case accessed credit through the banks, whereas the farmers from the Local case tended to access credit through informal credit providers such as family or the local money lender. As the Transmigratory farmers had been involved in the use of bank credit for much longer than the farmers from the Local case, they knew how to obtain credit from the bank because this had been promoted as part of the corn policy when it was piloted in this area.

Particular decisions around the timing of selling cattle in this research were also shaped by the access to credit and when they received the credit. As explained previously, the farmers in the Transmigratory case were more familiar with, and had better access to, bank credit for the past several years (the KUR²⁵ programme for crops) than the farmers in the Local case (Figure 7.7). This situation and the favourable interest rates which were much lower than those charged by the local money lenders, made the credit facilities provided by the KUR programme attractive to the Transmigratory farmers.

“More than 50% of the crop farmers here received the KUR programme... It is very helpful because the interest is only 0.6% per application. Hence, fewer farmers rely on rentenirs.” (Head of the village, the Transmigratory case, line 242-246)

Despite the fact that a large number of Transmigratory farmers accessed credit through the KUR programme, other farmers in the Transmigratory case did not apply for bank credit. Instead, they used their own money or savings, for example, through selling their cattle to support their crop farming activities if they did not have other sources of income or other assets that could be liquidated. Otherwise, they preferred not to grow crops in the year they did not have financial support. This is articulated by a farmer from the Transmigratory case:

“ [I sold cattle] to grow corn. Then I made bricks ... However the brick could not be sold [failed], so I could not grow corn [this year] ... I had [some cattle beasts] but I sold them for my child’s wedding, [and] building his house.” (Mr Fathul Rokhman, the Transmigratory case, line 139 and 266)

In terms of formal credit from the banks, there was uncertainty for farmers as to when they would receive the money. If the credit could be accessed before the beginning of the growing season, the farmers could use the cash from the loan to cover the cost of

²⁵ KUR (Kredit usaha Kecil) programme is a credit programme for small enterprises which was initiated by the central Government in cooperation with a government-owned bank. The types of KUR provided by the Government were KUR for cattle, and KUR for corn. Farmers could obtain a loan (KUR) from the bank through providing collateral. Cattle farmers needed to provide a cattle certificate or card, while crop farmers needed to provide motorcycle certificates or other assets which could be used as collateral.

farming. However, if the bank failed to provide credit in a timely fashion, then the farmers had to obtain funds from other sources such as their other income-earning activities or through the liquidation of assets that they held as a form of savings. Some farmers from the Local case did access bank credit, but it was more common for them to access credit from local money lenders or *rentenirs* than the farmers in the Transmigratory case. Although the interest rate charged by money lenders was much higher than the banks, the farmers in the Local case preferred to borrow from *rentenirs*, particularly when they urgently needed cash. Farmers in the Local case were less familiar with formal banking and found the process of obtaining credit from the banks difficult in comparison to the money lenders. The banks required collateral, the farmers had to fill in paper work and it took time to obtain the funds.

“Borrowing money [from a rentenir] is easier. When I need cash, it is available immediately compared to borrowing from a bank (laughing). [Borrowing money] from a bank has many requirements, certificates (for collateral), and paperwork. We have to do them all.” (Farmer group interview, the Local case, line 41-42)

Farmers from both cases, especially the WHHs, preferred to obtain loans from relatives. The relatives would lend them money for productive activities, particularly crop-growing without requiring collateral or charging them interest. As the WHHs did not need to provide collateral or interest, they tried to maintain the trust of the lenders by paying back the money as early as possible once they had sold their crops. The farmers in both cases could also obtain credit on inputs from input suppliers. Some farmers did not obtain credit from banks, money lenders, relatives or input suppliers because they were risk-averse (Figure 7.7). They were concerned that if their crops failed, they would not have enough funds to pay back the loan. This was an issue for both cases and many farmers sold cattle when their crops failed and they needed to pay their loans.

The farmers used income generated from other livelihood activities as the second source of funds after accessing credit to help fund the growing of their food crops. If farmers could generate funds from other livelihood activities such as brick making, bamboo screen making or labouring, then they could use these funds to pay for some or all of the costs of planting of their food crops. This meant that they either did not need

to sell cattle or they could sell fewer cattle than someone who did not have such sources of income. They might also delay the point at which they had to sell cattle. There were differences between the two cases in terms of the other livelihood activities farmers undertook over the wet season. Farmers in the Transmigratory case mainly earned income through labouring, whereas those in the Local case undertook brick making, bamboo screen making, and off-farm labouring or activities.

Importantly, a local informal institution or social norm that prioritised the liquidation of assets when funds were needed by farmers played an important role in determining when cattle were sold and how many. The sale of cattle was normally the last option farmers used to provide funds for food crop production. The liquidation of assets was initiated after the options of credit and income from other livelihood activities had been utilised.

A range of assets, other than cattle, were also kept by the farmers in both cases as a form of savings. These included gold, small livestock (poultry and goats), surplus stored rice and savings in the bank. The liquidation of these assets was controlled by strong social norms that were designed to protect the farmers' "large savings" in the form of cattle. Thus, if funds were required and a farmer needed to liquidate assets to provide those funds, the first asset they would liquidate was bank savings, followed by surplus stored rice, and then they would liquidate gold, and then small livestock. As a last resort, they would liquidate cattle to provide the funds.

c. The influence of the need for the purchase of assets on farmers' decisions to sell cattle

The farmers in both cases sold cattle to purchase assets and these assets could be land, vehicles and machinery or the building of a house. Interestingly, more Transmigratory farmers invested in cattle to fund the purchase of these assets as compared to farmers in the Local case. As the Transmigratory farmers had less access to forage (see section 7.3.2), when their cattle numbers became too high for the amount of forage and labour they had available, they had to sell surplus cattle. Their preference, if they had no other requirements for these funds was to purchase farm land. This was a stronger social norm in the Transmigratory case than in the Local case. However, the farmers in both

cases often did not need to wait to sell surplus cattle to buy other types of livelihood assets. That depended on the priority in their livelihoods. Some smallholder farmers who considered building a decent house being more urgent than keeping more cattle would sell their cattle to fund the house building. Some farmers also needed to buy vehicles (e.g. cars or motorcycles) and thus sold their cattle for this purchase. In the Transmigratory case, some smallholder crop farmers preferred to accumulate cattle to buy farmland and kept one or two cows to sustain their investment in cattle.

d. Other factors that influenced the selling decisions associated with cattle

For both cases, cattle were viewed as a form of savings, and that role influenced many of the farmers' decisions to sell cattle. However, other social norms influenced the decisions the farmers made in relation to selling cattle. The farmers then had to decide what cattle to sell. Strong social norms dictated that if they required funds and they had to sell cattle to raise those funds then, if possible, they should sell any unproductive cattle first. Such cattle would include male cattle and unproductive cows. Productive cows were only sold if they did not have any unproductive cattle available, as productive cows could reproduce and produce a live calf every year for 8 – 9 years.

Some farmers in the Transmigratory case sold their unproductive cattle when they did not have a particular need for money. This occurred because they did not have sufficient forage and/or labour during the wet season to retain the cattle, therefore, they sold these cattle once they had reached a suitable live weight for sale.

Importantly, for both case studies, the farmers' decisions to sell cattle were not dictated by price. In most cases, the sale of cattle was dictated by the need for funds. In the Transmigratory case, and to a more limited extent in the Local case, it might also be due to a lack of forage and/or labour for feeding and looking after additional cattle. This was primarily a problem for farmers who kept cattle solely in the village and did not graze them on common grazing land during the wet season. In both cases, the demand for cattle and the associated price increased near to the time of religious festival like Eid

al Adha²⁶. However, the farmers' decision to sell cattle was not influenced by these drivers.

Another reason farmers had for selling cattle in both cases was when cattle were badly injured or sick. Farmers would sell these cattle (bulls or cows) immediately to butchers to avoid the total loss of the animal due to death. Such cattle received a low price in the market and the butchers who purchased the cattle made a good profit.

The final factor that influenced farmers' decisions to sell cattle was when they were involved in a share-farming agreement (*kadas*). In this situation, a cattle owner might need funds and asked the keepers to sell some of their cattle. Second, a cattle owner might terminate the share-farming (*kadas*) agreement. The reasons for terminating the agreement were different between farmers. Some keepers were not willing to keep other people's cattle anymore, or the owners no longer wished to invest in cattle. Another reason might be both parties (cattle owners and keepers) could no longer trust each other, and there were other reasons to end the *kadas* agreement. In this situation, the keepers sold all of the owner's cattle and pass on the proceeds to the owners.

e. Factors that influence the farmers' decisions about how and to who they sell their cattle

A number of factors influence how farmers in the two case studies sell their cattle and to who they sell them (Figure 7.8). These include the influence of formal institutions, informal institutions and other factors such as cost and workload, and the state of the cattle at the time of sale. The Government had a policy to develop centralised sale yards in the region. The Government in Dompu then built these sale yards so that they could be used for the marketing of cattle in the region. However, farmers in both case studies did not use the centralised sale yards to sell their cattle and were mostly abandoned. This was because cattle were required to be quarantined before sale at the centralised

²⁶ During the Eid Adha, Moslems slaughter bulls, goats, or sheep that have a minimum age of 2 years as a part of the ritual in the Eid celebration. Moslems who slaughter the cattle beasts donate the meat for poor as well as consume some of it with their family. It is not compulsory for Moslems to slaughter animals, but many of them are happy to do it because they believe that this is a good deed that will be replaced with reward from God (Allah).

sale yards and thus there were additional costs, complexity and workload involved in the sale process. The farmers also stated that the prices they received from selling the cattle outside of the village at these centralised sale yards was higher than they would receive locally, but it was not high enough to offset the additional costs and workload required to get the cattle to market. These comments were reiterated by all the farmer participants in this study. One of them described this in the following quote:

“...[physical markets (centralised sale yards) do not work as expected because] the rules are too complicated. When [farmers] enter the markets, they need to cover many types of costs. The cattle have to be quarantined to ensure the cattle are healthy. Then they need to feed and control their cattle... and even they have to stay overnight [at the markets during these processes].” (Mr Maklum Amin, line 583-589)

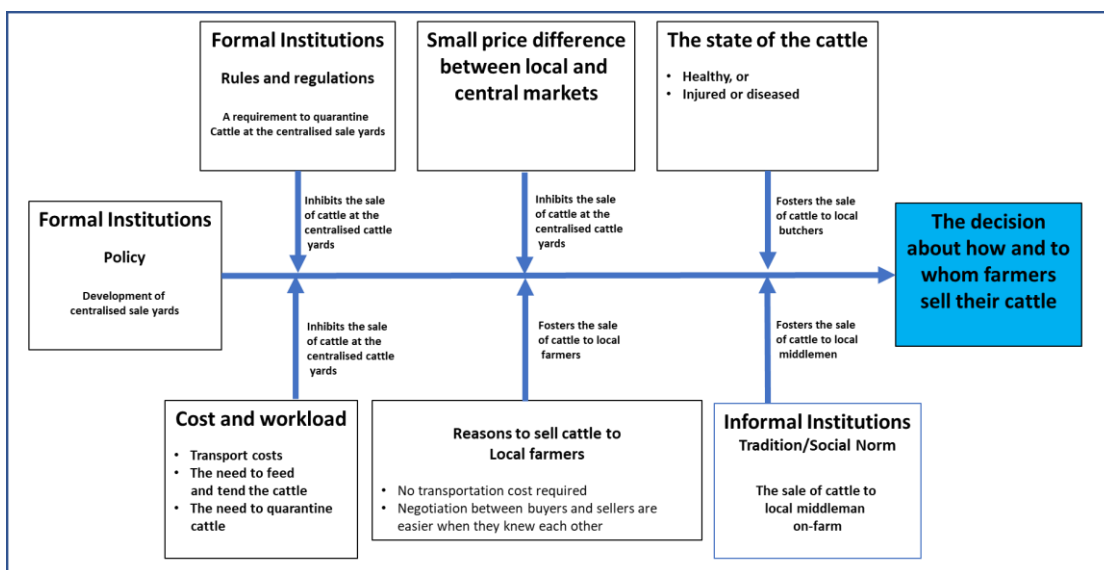


Figure 7. 8. The factors that influence farmers’ decisions about how and to whom they sell their cattle

Informal institutions, in the form of local traditions, also dictated how and to whom the farmers in both cases sold their cattle. The farmers preferred to sell their cattle the traditional way which was through a local buyer or local collector (middleman or *pelele*), a local butcher, or to other local farmers. In the Transmigratory case, there were informants who earned income from providing information for the local buyers

(primarily the middlemen) that someone was intending to sell their cattle and he or she was looking for a buyer. The role of this actor is called “*tukang catut*”.

When farmers needed to sell their cattle, the process was simple and convenient. They called the buyers and negotiated through a phone call or they met on the cattle owners’ farm. Then the buyers came to the farmers’ places (or in the Local case, buyers could also pick the cattle up at the grazing land gate) with their vehicle and took the cattle away. Although the cattle price was higher if cattle were transported and sold outside the village by the farmers themselves, transportation and labour costs were incurred and it was not as convenient as selling cattle locally on-farm.

At the local level, the farmers could sell their cattle to the middlemen, local butchers or local farmers. The state of the cattle dictated primarily whether cattle were sold to the middlemen or if they were sold to butchers. Middlemen were willing to buy sick or injured cattle because the price relatively dropped because of the state of their health. Both middlemen and butchers could gain more profit from the injured or sick cattle. However, if cattle were injured or sick, farmers preferred to sell their cattle to butchers directly because they could get a better price than selling them to middlemen. Farmers sold their injured or sick cattle to middlemen if they came earlier, and the price offered to the farmers were similar or better than the butchers’, and the transportation arrangement was covered. Farmers sold cattle to local farmers for several reasons. First, it did not require any transportation arrangements and, psychologically, the farmers who sold their cattle still could see their cattle around, although they did not own the cattle anymore. Second, both buyers and sellers felt that the negotiation between the two parties were easier and ran smoothly when both of them were close.

f. Cattle price trends and farmers’ participation in the cattle market

As stated before, the farmers in both cases treated cattle as a form of savings so that the primary reason for selling cattle was because they needed cash for the household. This is unlike what has been expected in rural development initiatives in developing countries where farmers are expected to be market-led in agriculture (Arias et. al., 2013), and cattle farmers in this study had not met the expectation. The farmers did not respond to price signals from the cattle market to determine when to sell their cattle. In

fact, many farmers sold cattle when the cattle price was low such as at the start of the crop-growing season. The farmers sold their cattle to provide cash to purchase inputs at the start of the crop-growing season. With the increase in supply of cattle at this time, the cattle price was low. In contrast, most of the farmers in both cases were not willing to sell their cattle, even though the market price was high, because during those times they did not need money. Farmers were aware of the periods of the year when the price usually declined in the district. This was normally from the beginning of the crop-growing season until harvesting, the period when cattle farmers often sold cattle to finance the growing of their crops. Despite this knowledge, many of the farmers still sold their cattle during this time to fund their crop operations. The farmers might decide to retain their cattle from being sold during the crop-growing season when they had more liquid assets than cattle and the amount of the assets available could meet the amount needed.

Another problem for the farmers in both cases is that they were often selling cattle because of an emergency. The cattle buyers or middlemen knew this and it placed the farmers in a poor bargaining position. Therefore, they often received a low price for their cattle.

g. The influence of formal institutions on farmers' decisions to sell cattle

A number of formal institutions or government policies influenced farmers' decisions to sell cattle in both cases. These government policies related to rural development programmes which were provided to the farmers in this study. These interventions not only comprised those programmes that targeted cattle farming, but also other development programmes which were not targeted at cattle production.

One of the most important policies that influenced farmers' decisions to sell cattle was the Government policy to support corn farming. This resulted in a rapid increase in corn farming in both areas and because farmers need to fund inputs to grow corn, this has been an important driver as to when many of the farmers sell cattle (See point f above). However, access to other development interventions also influence farmers' decisions to sell cattle. The Government provides grants to food crop farmers to obtain

subsidized fertiliser and free corn and, /or rice seed. The farmers in both cases received different inputs based on the types of the land they had (wet and dry farmland). In both cases, they received subsidized fertilizers for their food crops. The farmers in the Local case received free rice and corn seed, depending on the types of land they accessed or owned because there were irrigated and non-irrigated types of farmland which were suitable for rice and corn farming. However, the farmers in the Transmigratory case only received free corn seed because they did not have access to irrigated farmland. Some farmers in the Transmigratory case grew rice in their garden by storing rainwater, but they did not receive rice seeds as the garden was not identified as farmland by the Government. Moreover, the area for growing rice was small, so that a relatively small amount of money was required to grow the crop. Growing rice on the house garden was not a priority for the farmers in the Transmigratory area; if they did not have sufficient funding to grow rice, they would not do that. Since crop farming was the primary income activity for most farmers in both cases, and many of them sold cattle to provide funds to grow these crops, the provision of grants for fertiliser and seed meant that farmers did not need to sell as many cattle to fund their crop-growing operation.

Farmers, whether men or women, were required to join a crop farmer association in order to access government grants. The grants were distributed through the farmer associations. However, the farmers who leased-in land, or *garapped*-in land, often did not receive these grants because they were not registered as the user of the crop land. This was also a problem because the farmer associations did not keep a formal record of the leasing-in and *garapping-in* of land. Instead, the landowners were registered in the farmer association records and, as such, they received the grants. However, as the farmers who leased-in land or *garapped*-in land did not receive the grants, they had to sell more cattle or to access credits to fund their crops than if they had had access to the grants.

Sometimes, the inputs provided by the Government arrived late, and because the farmers could not postpone the planting of their crops, they had to buy the inputs by themselves. To do this, they had to sell their cattle if they had no other source of funds

(e.g. accessing credit or liquidating gold, stored rice or small livestock). When the inputs were received by the farmers, these were sold to other farmers who required them.

These results show that formal institutions in the form of government development interventions provided another source of funds to farmers for the cultivation of their food crops. Access to these funds reduced the farmers' need to sell cattle and, therefore, these funds were another factor that determined if farmers had to sell cattle, or the number of cattle they had to sell, in order to fund their production of food crops.

In summary, four sources of funds or financial capital can be identified for the production of food crops in the two cases (Figure 7.9). These include sources of credit, development interventions, other livelihood activities and assets that can easily be liquidated. Sources of credit can be further subdivided into formal and informal sources of credit (Figure 7.9) with banks, micro-credit firms and input suppliers providing formal lines of credit, and money lenders, friends and family the source of informal lines of credit. The greater a farmer access to these different sources of funds or their financial capital the less likelihood that they would need to sell cattle to fund the production of their food crops.

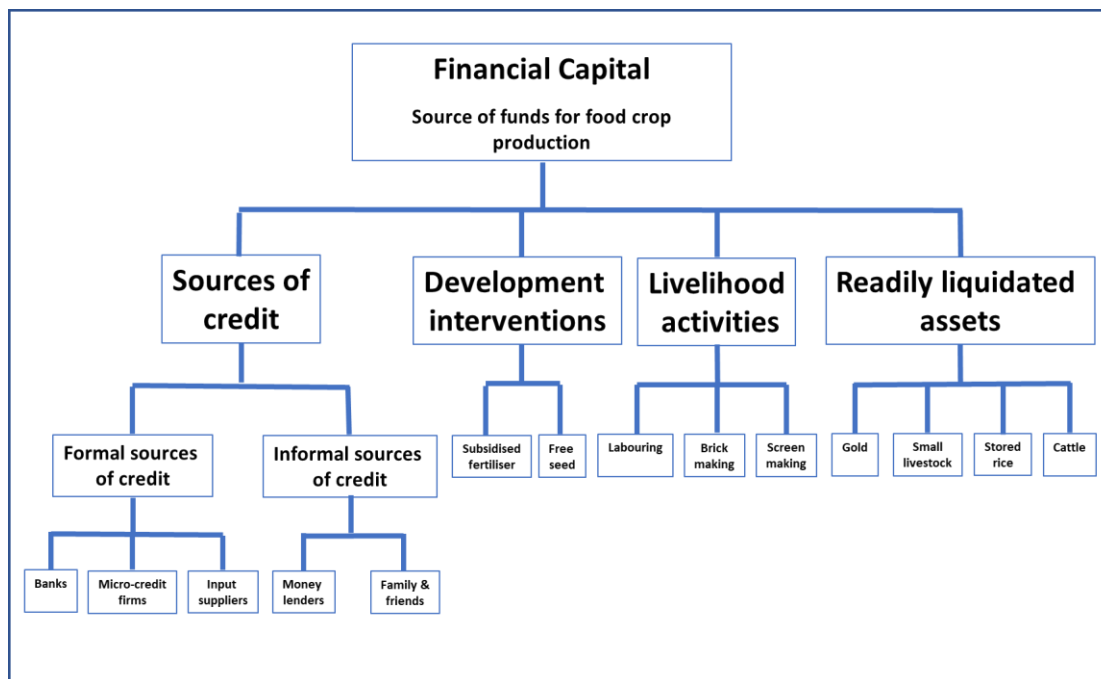


Figure 7. 9. A typology of the fund sources farmers could use for food crop production

Other development interventions, not related to cattle farming, influenced the sale of cattle in both cases. These were a healthcare insurance and a slum house rebuilding programme run by the Government. As mentioned previously in this section, the key reasons for farmers selling cattle in both cases were to cover medical costs in an emergency and to build a house. If farmers could access these programmes, it reduced their need to sell cattle. Few farmers in both cases (one household in each case in this study) were aware of and used the free healthcare service. They reported that because they had health insurance, when there was an emergency, they did not need to sell cattle, because their insurance policy covered their medical costs. They usually did not register for the free healthcare insurance because they were reluctant to do the process of registration which they thought was very complicated and time-consuming. Moreover, many of them were illiterate. The farmers did not understand what to do and were hesitant to find the information until they needed the free healthcare services without delay.

Few farmers in this study were targeted by the slum housing rebuilding programme; an initiative that helped poor rural people to obtain proper housing. Two farmer

households in the Local case received funding from the Government from this programme, and none of the farmers in the Transmigratory case had accessed the fund. The number of houses in both cases that fulfilled the formal criteria of receiving the funding for house re-building was not high. For example, a house that was considered a slum house was at least semi-permanent (cement floor with old bamboo screen or wood wall, and a roof in poor condition), while, the houses in both cases were mostly better than the criteria set up by the Government. The farmers needed to wait quite a while to learn whether or not they had been successful in receiving the slum house funding. The conditions of the farmers' households were also surveyed by the local Government for considerations to be granted the slum house re-building programme, for example, how many family members, the sources of and total income, assets owned by the households, and so on. Hence, it was not an easy procedure to receive the funding. The farmers who urgently needed to rebuild their house then preferred to sell their cattle rather than wait for the result in uncertainty. The funding from this programme meant they could prevent their cattle from being sold, or, at least, to reduce the number of cattle they had intended to sell in order to rebuild their houses.

7.3.4. *Factors that influence farmers' cattle healthcare decisions*

In terms of accessing and using cattle healthcare services, the responses were different between farmers across the cases and among the farmers within the same case. Overall, this research found that the cattle farmers in the Transmigratory case were much more proactive in using the Government veterinary service compared to the farmers in the Local case. This variation was influenced by differences in social norms around cattle health care between the two cases, where the farmers in the Transmigratory case kept their cattle more intensively than the farmers in the Local case which shaped their responses to veterinary healthcare services (Figure 7.10). The use of veterinary services was also influenced by the seriousness of the cattle animal health problems faced in each case study and these factors combined to influence the farmers' awareness of the veterinary services provided by the Government.

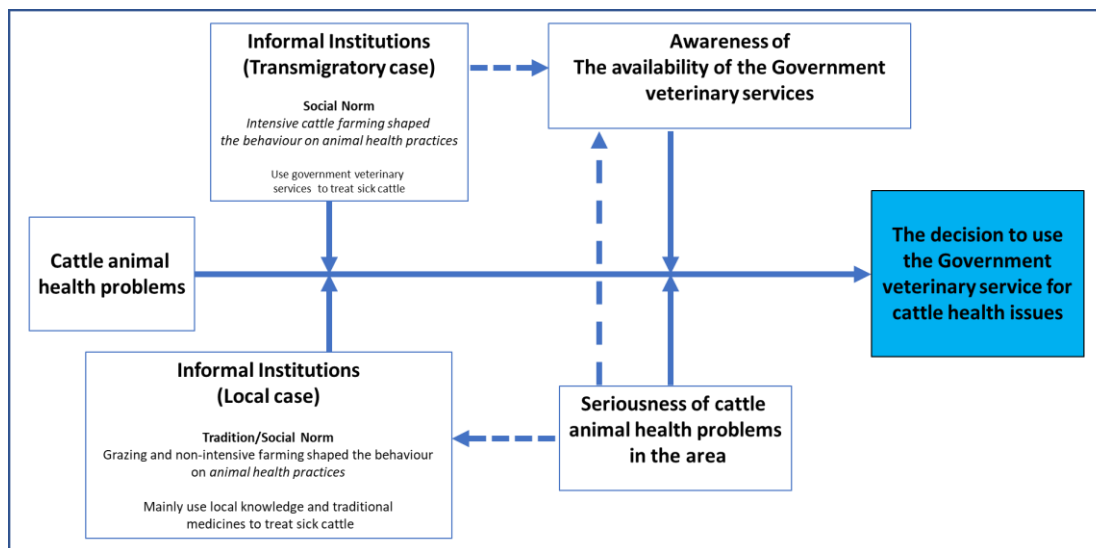


Figure 7. 10. The factors that influence cattle farmers' use of government veterinary services

In the Transmigratory case, all farmers kept the cattle more intensively in their village and the number of cattle was limited due to restricted labour and forage, attention to their cattle was also more intensive. Hence, when their cattle were sick, the majority of the smallholder farmers used the services of a government veterinary paramedic. Normally, the paramedics were contacted if the farmers' cattle were sick, particularly if they had a serious illness. This was described by a woman cattle farmer in the Transmigratory case:

"... even when there is a small health issue, I usually call the vet paramedic to get injections [for my cattle] ... I paid for the service... it is important. The cattle health is important although I have to pay for that." (Mrs Dita Pujiani, WHH, the Transmigratory case, line 726-734)

In this study, the two cases were in areas of the province that were free from all the strategic diseases (see section 5.2.4). Hence, in both cases, the cattle diseases were considered mild level such as eye worms, stomach-ache, or injured. The difference between the farmers in both cases was how they responded to the availability of the veterinary healthcare services. All of the farmers who owned cattle in the Transmigratory case were familiar with the Government veterinary service. They all

had a record of the veterinary paramedic's contact details so that they could contact them if their cattle were sick. The majority of the Transmigratory farmers believed that, even though it cost money for the veterinary services, it was cost-effective because healthy cattle beasts grow well and this will more than cover the cost of the treatment when they sell them. This attitude reflected the social norms of the Transmigratory farmers in relation to cattle management (Figure 7.10). They believed that it was important to use veterinary services to ensure their cattle were healthy because this would improve their physical appearance which determined the price of the cattle when they were sold. This drove their use of the Government veterinary service and also meant that all the farmers were very aware of the services they could obtain from this service provider (Figure 7.10).

In contrast to the Transmigratory case, the majority of the Local farmers kept their cattle less, or less intensively, and preferred to raise cattle in a grazing area with minimum attention to the cattle. When the cattle were sick, the majority of the farmers did not use the Government veterinary service because cattle were released in a large common grazing land. It was also a social norm among the farmers that they would rather use traditional medicines and local knowledge to manage the animal health problems faced by their cattle. Social norms around the use of traditional animal health practices meant that farmers did not use the Government veterinary service as intensively as the farmers in the Transmigratory case (Figure 7.10). However, some of the farmers in the Local case did use the veterinary service. This was when the cattle sickness was severe and could not be cured traditionally. Some of the other farmers had a similar awareness as the farmers in the Transmigratory case regarding the importance of using the veterinary services regardless of the cost spent on the treatment to improve the cattle's health. However, not many farmers in the Local case had such level of awareness due to the social norms around the cattle healthcare method.

It is important to reiterate that the cattle in both cases rarely had serious health problems (Figure 7.10). However, different from the farmers in the Transmigratory case, the farmers in the Local case were satisfied with their traditional methods of treating sick cattle and did not try to find information about veterinary services. As a

result, there was little awareness of the Government veterinary service and what it had to offer farmers (Figure 7.10). This is demonstrated in the following quote from a farmer from the Local case.

"[Saya] tidak pernah mencoba panggil [petugas] juga karena sapi tidak pernah sakit ... [saya juga tidak pernah coba IB] karena tidak pernah ada orang datang menjelaskan tentang IB ini." (Mrs Dahniar Rena, WHH, the Local case, line 114 and 132)

"[I] have never called [the vet paramedic] because my cattle never get sick ... [about the AI, I have never tried it] because there was no information about it from anyone." (Mrs Dahniar Rena, WHH, the Local case, line 114 and 132)

7.3.5. The factors that influence farmers' decisions about cattle mating

A comparison of the cattle-mating management of the farmers in the two cases identified that the majority of the Transmigratory farmers used artificial insemination (AI) whereas the majority of the Local farmers used natural mating. A range of factors influenced the farmers' decision to use AI or natural mating. These included formal institutions, informal institutions, access to natural and physical capital and human capital (Figure 7.11). Importantly, a formal institution, a government policy to provide a free AI service to farmers, gave farmers an incentive to use the service. However, for farmers to use this service, they need to be aware of the benefits of AI. The study found that all of the Transmigratory cattle farmers that were interviewed were aware of the benefits of AI in terms of choice of cattle breed and calf quality. This awareness had created a social norm or practice norm where Transmigratory farmers believed that because of these benefits, it was good practice to use AI. In contrast, few of the Local case cattle farmers were aware of the benefits of AI. However, some farmers in the Local case were aware of the benefits of AI and had adopted it.

"[the farmers] were enthusiastic [in using the AI], because the quality of the breeds is good. The supply of the semen was below the demand. Sometimes, the

stock of semen had run out. We serve 2-3 customers per day.... The demand was mostly from the farmers who kept their cattle at home instead of from those who graze their cattle.” (Mr Rukmana, the Head of the Livestock Service, the Transmigratory case, line 130-133)

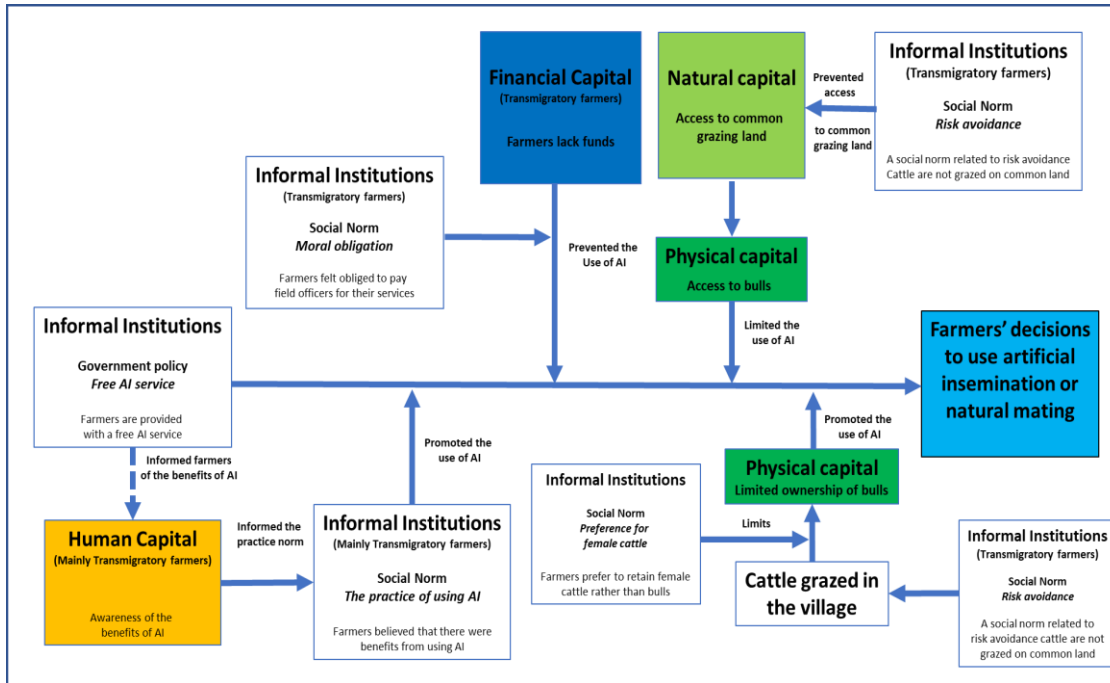


Figure 7. 11. The factors that influence farmers' decisions in terms of mating management

The other reasons the Transmigratory farmers used AI was linked to the social norms around risk and access to common grazing land and breeding bulls. Although the Transmigratory farmers had common grazing land situated some distance from their village, the majority of farmers did not use this land during the wet season because of the risk of death or injury to their cattle (Figure 7.11). Owing to this social norm, or practice norm, the farmers tethered their cattle in the village or placed them in stalls. Limited labour and poor access to forage over the wet season meant that the farmers could only run limited cattle numbers. There was also a strong social norm around what cattle to retain and the farmers had a preference for retaining female cattle because they could produce a calf. Thus, many of the Transmigratory farmers sold their male cattle to fund their food crop production prior to the mating season and did not

own bulls that could be used for breeding. This meant that they had to either use AI or hire a breeding bull from another farmer. As the Transmigratory farmers believed that they gained much more benefit from using AI, they preferred to use the AI service rather than hire a bull. However, a number of farmers did hire breeding bulls when they could not afford the cost of AI. The cost of hiring bulls was 20% of the cost of AI.

The study found that some Transmigratory farmers did use natural mating and this occurred due to the influence of a social norm around the use of AI services and a lack of financial capital (Figure 7.11). It was found that, although the Government provided a free AI service, the farmers believed that they had a moral obligation to pay the field officers who provided the service a fee. If farmers lacked funds at the time of mating and could not provide the AI field officers with a fee, they would instead use natural mating. They would hire a bull unless they owned suitable male cattle which they could use for mating.

In contrast to the Transmigratory case, few cattle farmers in the Local case used AI or hired breeding bulls. As previously stated, AI was used by some Local farmers because they were aware of the benefits of AI, but the majority of Local farmers used natural mating and did not hire bulls. This difference can be attributed to differences in social norms around using common grazing land during the wet season and grazing cattle in the village during the non-crop growing season (Figure 7.11). The farmers in the local case had a tradition of doing this, whereas the Transmigratory farmers had social norms related to risk averseness which meant they did not graze common land during the wet season. As the Local farmers grazed their cattle the whole year (in the village during non-crop growing season and in the common grazing land during the crop -growing season) there were a number of bulls, access to bulls was not a problem for the farmers. Hence, they did not need to use AI. Using natural mating for free was a practical norm shared among the farmers in the Local case. Although some smallholder farmers did not have male cattle and did not graze their cattle in the common land during the wet season, they could tether their cattle together with other farmers who had male cattle. The study also found that the majority of the Local farmers were not aware of the benefits of AI. The farmers in the Local case were much more traditional in their farming methods than the Transmigratory farmers. The use of traditional mating

methods and common grazing land over the mating season has meant that the majority of Local farmers have not needed to access new technologies such as AI.

7.3.6. *The influence of cattle development interventions on smallholder farmers' decisions on their cattle*

There were rural development interventions (formal institutions) related to cattle farming which supported smallholder farmers, including the farmers in this study. Some farmers were the targets of the development interventions. However, there were others who did not have access to them. In the implementation of the interventions, there were social political issues and norms that shaped the ways the farmers responded to the interventions.

a. Cattle grants

The Government provided cattle grants to farmers through farmer associations or groups which, in effect, provided farmers with free cattle. The aim of these grants of formal institutions was to increase cattle production in the region. However, there were a number of unintended consequences which occurred in response to the provision of cattle grants provided by the Government.

The farmers in the Transmigratory case who received cattle grants in this study reported that they were not happy with the programme. During the implementation of the cattle grant programme, some farmers did not receive the cattle, although they were listed as the members of the association who were supposed to receive the grant. The process used to allocate cattle grants to farmers was not transparent and this upset many of the farmers. In this case, the farmers who belonged to a livestock farmer association were gathered and informed about the cattle grant by the group board members and the local government. The cattle were formally handed in to the group through the board members. However, the cattle were never shared with the group members and the farmers did not know where the cattle had gone. The farmer members did not ask for clarity from the board members because they did not want to raise any conflict. Nevertheless, it became a source of gossip among the community.

Problems also occurred with the Transmigratory farmers who received the cattle grant (Figure 7.12). These problems happened because the Government did not understand the importance of the social norms around the function of cattle (as a form of savings), the social importance of traditions such as weddings and the issues the Transmigratory farmers had with accessing forage and labour during the wet season (Figure 7.12). These farmers did not understand that the Government was providing them with free cattle so that they could increase their cattle numbers and also increase beef production within the region. The farmers treated these cattle in the same way that they treated their own cattle, as a form of savings. The farmers saw the cattle grant as a means of increasing their savings which meant that they had more capital and this could be used to fund areas of consumption upon which they relied for their cattle. Owing to the social norms around risk, the Transmigratory farmers retained their cattle in the village during the wet season and this created problems in terms of access to forage and access to labour for harvesting forage. This limited the number of cattle these farmers could carry over the wet season (See section 7.3.2) and, as such, they could not carry the additional cattle provided by the grant programme, so they had to sell them. When a farm household held a family wedding, they could, therefore, have a more lavish occasion because they had additional cattle that they could sell to fund the wedding or slaughter to provide food for people at the wedding. By providing a more lavish wedding, this increased their social status in the community. The cattle grants did not increase cattle production, because the Transmigratory farmers could not carry the extra cattle and thus, they were used for consumption purposes. This issue is articulated by an informant below:

“... the guys (who received a cattle grant) were overwhelmed. The farmers sold the cattle before they get the yield so that the programme was not easy to be sustainable. Many of us, the Lombok people (the Transmigratory households) spend our money on unproductive activities, for example, to fund a wedding when our children get married. Basically, we can throw a day wedding party, yet we push ourselves to show-off until we sell our cattle (from the programme).” (Head of the village, the Transmigratory case, line 680-685)

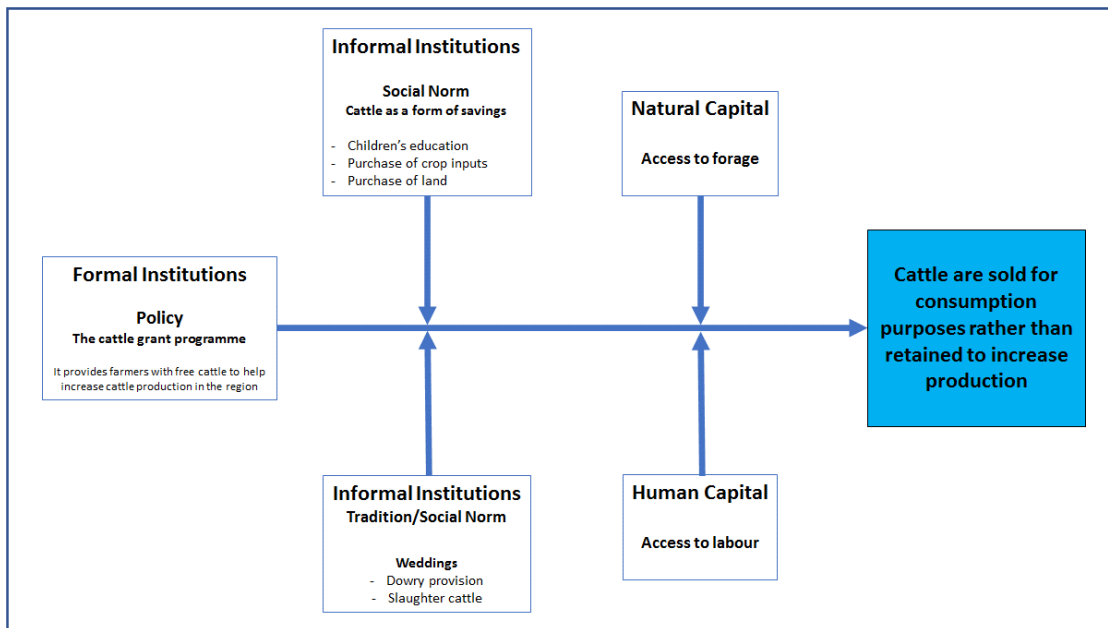


Figure 7. 12. Factors that influenced the Transmigratory farmers use of cattle grants

In contrast to the Transmigratory case, farmers' responses to the cattle grant programme were more positive in the Local case. Firstly, they did not have problems with farmers not receiving a cattle grant. This was because there were strong social norms in these groups around fairness (Figure 7. 13). The leaders of the livestock associations in the Local case shared the cattle that were granted equally to all of the members immediately after they received the grants. The farmer members reported that this sharing process was fair. However, the farmers in the Local case who received the cattle grants also viewed cattle as a form of savings in the same manner as the Transmigratory farmers. If they needed funds for large expenditure items, they also sold the cattle they obtained through the grants to fund consumption.

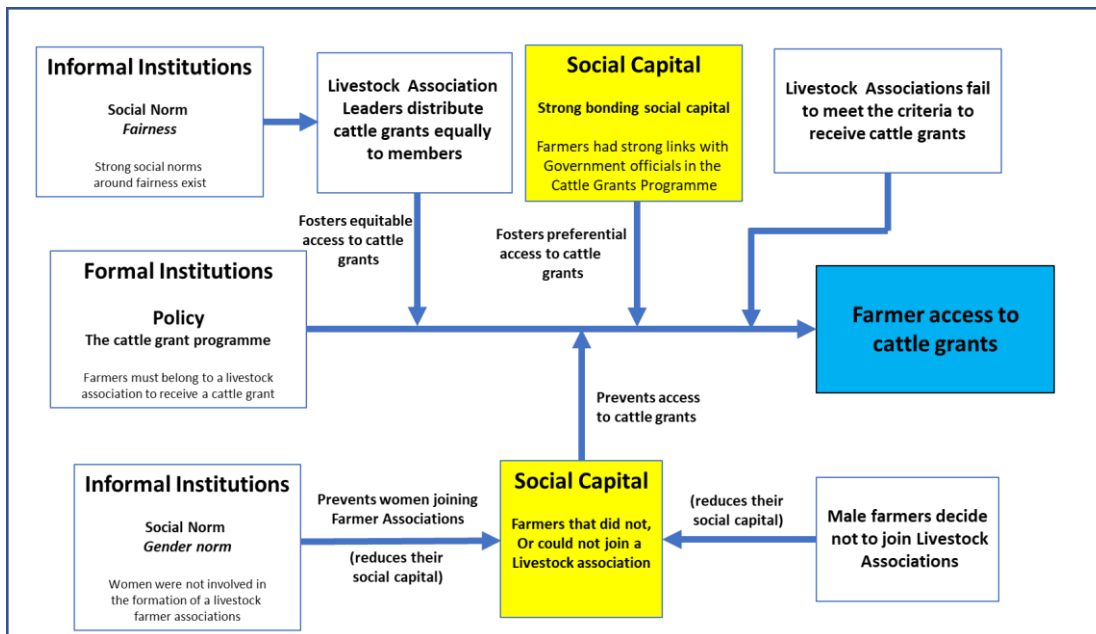


Figure 7. 13. Factors that influenced farmers' access to cattle grants

The Government did not provide cattle grants for all of the farmers in the district area where the study was conducted because of limited funding. There were a number of farmers, in both cases, who did not receive a cattle grant. A number of reasons were identified as to why farmers in both cases did not receive cattle grants (Figure 7. 13). The first reason was that livestock or cattle farmer associations who had applied for a grant programme failed to meet the grant requirements. Some examples of the requirements are the group had a communal shed for the group, provided clear planning activities to manage the cattle grants, and so on. Second, farmers who were not members of a livestock association could not obtain cattle grants. Failure to join a livestock association reduced a farmer's social capital and, as a result, subsequent access to information and resources such as cattle grants. The farmers also reported that some farmers obtained preferential access to the cattle grants (Figure 7. 13). These tended to be individuals who had a bonding social capital (family, relatives, best friends or colleagues) with individuals in the Government who provided the grants.

Equality in terms of access to the cattle grants between men and women was also an issue in both cases (Figure 7. 13). Women were not able to join livestock farmer associations owing to the patriarchal nature of their society. Hence, this reduced their

social capital relative to man farmers and WHHs in both cases could not access cattle grants.

b. Cattle certificates

The Government provided certificates or cards for the cattle in Dompou district. The certificates were used to register the existing cattle in the region and they included data such as the cattle's physical characteristics, the location of the cattle farm, sex, age, and other information. The certificates had several advantages for the Government, farmers, and cattle traders. For the Government, the cards helped them collect data about the cattle population in the district at a particular time. The Government also could monitor the production of cattle (whether it increased or declined) in the district, identify lost cattle, and monitor the mobility or distribution of cattle. There were a number of factors that influenced whether or not farmers obtained a cattle card (Figure 7.14). For the farmers, cattle cards helped to validate the ownership of cattle, especially when farmers lost their cattle. Farmers could also use the certificates as collateral with a bank when applying for a loan (e.g. the KUR). The banks had a formal institution in the form of a banking regulation that required farmers to provide collateral in the form of a cattle card (Figure 7.14). Farmers also had to provide certificates when they brought cattle in or out of Dompou district. The certificates had to be shown at the district border to the border officers (Formal institutions) (Figure 7.14).

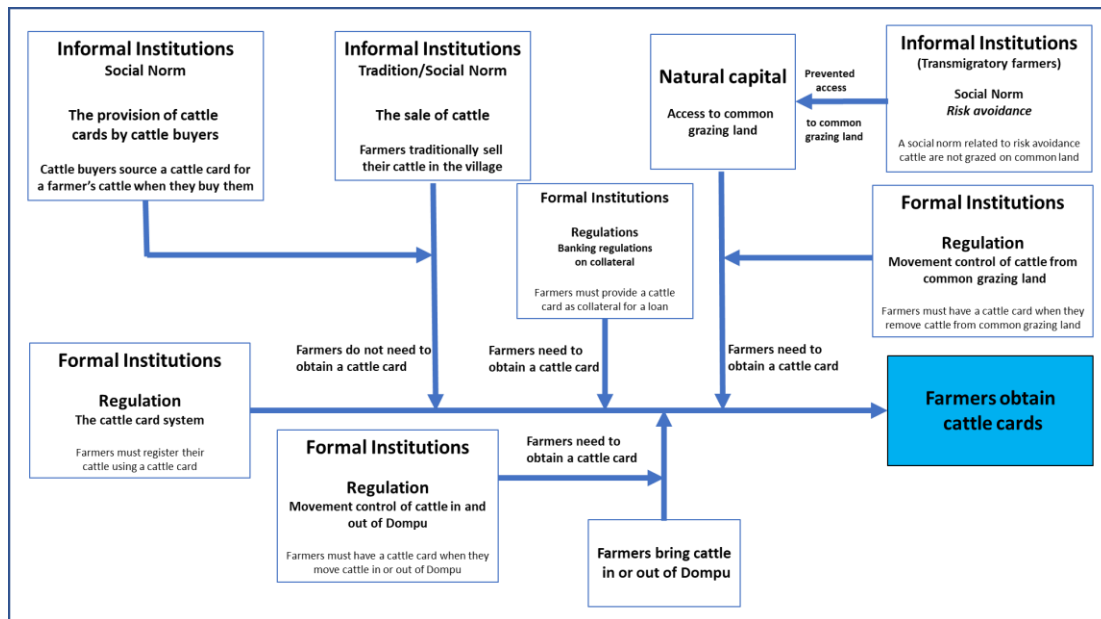


Figure 7. 14. The factors that influence whether or not farmers obtain a cattle card

This research found that not all of the farmers in both cases applied for a certificate or cattle card because there was no enforcement of the process by the Government. Those who needed the certificates would usually apply for them. The farmers in the Transmigratory case did not apply for certificates because they normally kept and sold their cattle in the village (Figure 7.14). Hence, the middlemen or agents who bought cattle from the village and sold them outside of Dompu, applied for the certificates. This did not influence the price of the cattle that were sold by the farmers. The middlemen did not charge the cost of obtaining a cattle card on the farmers' behalf.

On the other hand, the farmers in the Local case, particularly those who transported their cattle to the common grazing land, needed to apply for the certificates. This was because the farmers had to show the certificates to government officers at the common grazing land gate. Farmers who did not transport their cattle to the common grazing area did not apply for the certificates. Some Local farmers who did not access common grazing land also did not require a cattle card unless they applied for a bank credit (e.g. the KUR) (Figure 7.14). Therefore, in this situation, the buyers or middlemen who exported cattle outside of the district would apply for the certificates after they bought the cattle from farmers.

7.4. Summary of the chapter

This chapter is a cross-case analysis that compares the findings between the Transmigratory and the Local cases. The comparisons include two main sections; first, broader livelihood characteristics of both cases are described and compared and, second, the comparisons of factors that shaped the smallholder farmers' decisions related to management of their cattle. This cross-case analysis is viewed from the perspective of sustainable livelihoods.

In the first part, the characteristic description of the smallholder farmers' livelihoods includes vulnerability contexts, livelihood assets, institutional aspects, and livelihood activities. The study found that crop-cattle farming were important livelihood strategies that shaped smallholder farmers' management of their cattle. In relation to this, farmland, mixed means of saving, labour, government services, and farmer associations were the examples of key important assets that shaped smallholder farmers' decisions on their farm enterprise including cattle in both cases. Formal and informal institutions also shaped the management of cattle. The formal institutions include the regulations or the rules from the Government, for which the application was relatively the same between the two cases. However, there were similarities and differences of the social norms between the two cases in this study that shaped how people carried out their livelihood activities including the response to the formal institutions. Livelihood activities were varied in both cases, whether on-farm and off-farm. Farming cattle was one of the activities, yet it was mainly not the main source of income. Crop farming was the main income activity of the majority of the farmers in this study. Therefore, smallholder farmers allocated most of their assets (e.g. money, labour, or land) to farm crops, but not for cattle. However, for social and cultural reasons, investing in cattle is an important means of saving and accumulating assets in both cases.

In the second section, the comparisons relate specifically to factors that shape management of cattle in both cases. The smallholder farmers' management of cattle includes decisions around the reasons for the ownership, purchasing, number, and selling of cattle. Those are also related to factors that shaped decisions around cattle

healthcare and mating, as well as the implications of development initiatives to farmers' decisions on their cattle.

This study identified that mixed factors in smallholder farmers' livelihoods influenced their decisions around ownership and purchasing cattle. The functions of cattle, or the ways cattle are used in smallholder livelihoods, were influenced by social norms in both cases, for example, to fund large expenses or traditional events. Natural and financial capitals, and mixed informal institutions influenced the reasons to own and purchase cattle in both cases. The farmers who could access land (Natural capital) for forage and who had enough money (financial capital) to buy cattle might decide to own or purchase cattle. The difference was in the roles of social norms concerning strategies to own cattle such as through *kadas* or shared-farming system. When buying cattle was unaffordable, *kadas-in* other people's cattle might become the solution of a lack of fund for poor farmers.

The livelihood aspects such as human, financial and natural capitals are the factors that influenced the decisions on the number of cattle being farmed. The vulnerability context like seasonality, formal institutions (e.g. corn and rice development initiatives), and mixed informal institutions, also had a part in shaping smallholder farmers' capability and decisions to keep a particular number of cattle.

The reasons for selling cattle are closely related to the functions of cattle for smallholder farmers' livelihoods. As explained earlier, in both cases cattle were primarily viewed as a means of saving. Smallholder cattle farmers could sell or use their cattle for various purposes such as for maintaining social relations, funding other livelihood activities, and purchasing other assets. Some of the purposes were influenced by social norms such as selling cattle to fund a wedding ceremony in both cases. The reason for selling cattle was when the cattle were sick and the condition could not be recovered, or when its number exceeded the maximum capability to farm cattle (the availability of labour and forage). The key difference between the two cases relating to whether or not to sell cattle was on the capability to keep cattle, which was shaped by social norms around the strategies to deal with forage and labour availability. The Local

farmers who had access to grazing land the whole year was potentially to increase as many cattle as possible.

In terms of selling cattle, other decisions were identified in this study such as how and to whom smallholder farmers sell their cattle, and their response to cattle price trends and to formal institutions in supporting cattle market. Informal institutions again shaped these decisions. In the Local case, smallholder farmers preferred to sell their cattle at their farm gates or at the grazing gate as this could avoid transportation or other costs. This practice around selling cattle made smallholder farmers not use the cattle market yard provided for them. The smallholder farmers in both cases were not stimulated by price trends in selling cattle. Instead, they sold cattle when they needed the amount of cash that was equal to the value of their cattle beasts.

The smallholder farmers' level of attention to the healthcare and mating was different in both cases because of their differing social practices on cattle farming. The smallholder farmers in the Transmigratory case farmed cattle more intensively than did the farmers in the Local case. Hence, the farmers in the Transmigratory case used healthcare services (formal institutions) and artificial insemination more than the farmers in the Local case. The Local farmers tended to use the natural mating strategy and traditional ways of healthcare.

Smallholder farmers' decisions on cattle were also shaped by development interventions. Cattle grants and cattle certification were parts of cattle development interventions that influenced smallholder farmers' decisions on cattle. In terms of cattle grants, aspects of transparency of implementation of cattle grant programmes, gender roles, and the functions of cattle were identified as the aspects that shaped the implications to management of cattle. The similarities between the two cases were related to the transparency and gender roles in receiving grants that had excluded some smallholder farmers from receiving grants. In terms of functions of the cattle, whether the smallholder farmers owned or received grant programme, the cattle were primarily viewed as a means of saving. Hence, smallholder farmers' decisions on the owned or granted cattle were the same as the other cattle kept by the farmers. The farmers would

sell their cattle when they needed cash or when they exceeded the maximum capability to farm cattle.

With respect to responses to formal institutions to support cattle farming, this study identified some evidence on how social norms in farming practices also shaped smallholder farmers' responses to the formal institutions. For example, in applying for cattle cards or certificates, every cattle beast is expected to have a cattle card/certificate by the Government as the proof of ownership for farmers. However, the motivation of farmers to apply for the cards was based on its degree of urgency. For the farmers who just kept their cattle in the village as in the Transmigratory case, they were reluctant to apply for certificates. Hence, the buyers who would transport cattle outside of the district needed to apply for the cards. On the other hand, the farmers in the Local case applied for cattle certificates as a requirement to enter and to transport cattle out of the main grazing area.

Chapter 8: Discussion

8.1. Introduction

This thesis has answered the research question “What shapes smallholder farmers’ cattle management in NTB Indonesia and why?” By answering this question, the research enriches understanding of the livelihood dynamics, the inter-relationships between smallholder farmers’ assets including cattle and the functions attributed to these assets and how that ultimately plays out in farmer decisions and management relating to cattle. Further, the research provides practical insights as to why market led development initiatives that target single livelihood activities of smallholder farmers may not achieve the intended outcomes. NTB had been targeted by a government development initiative directed at encouraging smallholder farmers to increase the number of cattle they farm in a national drive for self-sufficiency in beef production. The intervention is not evidenced as having any major impact for smallholder farmers in this research. What this research does do is provide a rich illustration of the finely tuned multidimensional livelihoods of smallholder farmers who manage cattle to fulfil both a savings and social function that complements the overall household livelihood portfolio. This chapter explores the answer to the research question by highlighting the insights drawn from this research and from the literature reviewed in this thesis. In doing this, the contribution this research makes to theory and practice is outlined, also.

This chapter is divided into eight sections. It is started with Introduction in section 8.1, and followed by section 8.2 about what constitutes cattle management. Section 8.3 discusses the fact that the cattle farming in this study is supply-driven, followed by section 8.4 around the position of cattle within the whole livelihood portfolios and section 8.5 about the dynamics around social function of cattle in shaping decisions on cattle. In section 8.6, it discusses around the roles of socio-cultural norms in shaping cattle farming, section 8.7 explores the implications for development initiatives, and it is closed by a brief summary of the Discussion chapter.

8.2. What constitutes cattle management

Management of cattle in this study emerged as involving primarily decisions around ownership or purchasing cattle, number of cattle owned/managed as well as decisions around buying, selling, retaining, and slaughtering/sacrificing cattle. The management of cattle also involves decisions relating to the nutrition, healthcare and mating of cattle. This mix of decision points that constitute cattle management for smallholder farmers reflect the functions attributed to cattle and likewise the functions attributed to other assets and activities that comprise the smallholder farmers' livelihood portfolio and the relationship the functions of cattle have to those of other household assets.

In contrast, cattle production and marketing tends to be the focus of literature on cattle management of smallholder farmers (e.g. Lisson et. al., 2010; Murugani & Thamaga-Chitja, 2018) and many of these studies view cattle in isolation of other enterprises and livelihood activities of smallholder farmers. Although the mixed functions of farmer households' assets including cattle are acknowledged by scholars (e.g. Bettencourt, et. al., 2015; Kent & Dorward, 2015) no studies have explored how this then shapes farmers' management as this study does. Hence many of these studies fail to accurately reflect smallholder farmers' perspectives of cattle.

A study in NTB and Bali provinces, Indonesia identified the saving, production, and social functions associated by smallholder farmers with cattle (Patrick, 2010). The scholar looks at how the saving, protection, production and social functions shape the market trends (price and supply demand trends). Other studies also identified that cattle have mixed functions and attributes in household livelihoods (Bettencourt et. al., 2015; Kent & Dorward, 2015). However, to date studies have not identified how this shapes smallholder farmers' cattle management.

8.3. Farmer-supply driven market for cattle

The market demand and price for cattle and beef has little to no impact on smallholder farmers' decisions to buy or sell cattle. The market is very much driven by farmers' supply of cattle for sale or demand from farmers to buy. Smallholder farmers' decisions

to sell cattle in this research are driven by a need for an amount of money to meet household livelihood demands, and this is in line with the finding in NTB and Bali provinces reported by Patrick (2010). Decisions to purchase cattle reflect a need to save the value equivalent to the monetary value of an animal at the time of purchase. This is very much counter to a market-led approach to cattle production and marketing and highlights the fundamental difference in conception of cattle by smallholder farmers in this study where production, exchange (income) and consumption are not the functions of cattle. However, it is the convertibility and productive attributes of cattle, along with their complementarity in the household saving strategy that enables cattle to fulfil the savings and social functions for which they are valued by smallholder farmers.

8.4. Cattle as part of the whole smallholder farmers' livelihood portfolios

In this study, cattle have a unique position and functions in the household livelihood and decisions on managing cattle reflect this and the interactions with other assets and activities. In this section, there are three sub-sections: a mix of saving and social functions, cattle as part of a household mixed saving strategy, and the nature of interactions between different assets and activities in influencing smallholder farmers' decisions on cattle.

8.4.1. *A mix of saving and social functions driving cattle management*

The mix and relative importance of functions attributed to cattle by smallholder farmers in this study shaped the management of cattle, as is proposed by the work of other scholars (e.g. Dorward et. al., 2009; Bettencourt et. al., 2015; Neudert et. al., 2015; Ng'ang'a et. al., 2018). Cattle are valued by smallholder farmers in NTB Indonesia predominantly as a form of saving but also for their social functions. These functions reflect multiple attributes of cattle (following Dorward et. al., 2005) including convertibility, complementarity and productivity. Cattle and other livestock's multiple functions for smallholder farmers have been reported by other scholars (e.g Bettencourt et. al., 2015, Wangchuk et. al, 2014.). However, the mix of only savings and

social functions reported for smallholder farmers in NTB has only been identified as existing in Mozambique (Ng'ang'a et. al., 2018). In Madagascar (Neudert et. al., 2015) and Timor-Leste (Bettencourt et. al., 2015) cattle and other livestock fulfil a savings function. However, unlike in these other studies cattle in this doctoral research were not valued as a form of production, income nor consumption. Although amongst case study farmers cattle were slaughtered to be eaten or sacrificed at special events like weddings and religious celebrations, cattle did not provide a staple source of food for the farming household neither in the form of beef or milk. The attribute of production (cows producing calves) was valued because it enhanced and enabled the saving, and some of the social functions of cattle rather than it being an end in and of itself.

The management of cattle by smallholder farmers is shown in this research to be related not only to the functions they fulfil for smallholder farmers but importantly by the functions they do not fulfil that are fundamental to the sustainable livelihood of the smallholder farmers. The implications of this for cattle management were in the relative allocation of household labour able to be provided to care for and provide feed for the cattle, on decisions around obtaining, ownership, buying, selling, and retaining, as well as provision of healthcare and mating of cattle. Household labour was prioritised at critical times on activities related to the functions of consumption and production with activities required to fulfil the savings and social functions fitting around these priorities. The prioritisation of activities at any time, and hence the management of different assets, related to the differing mix of functions of assets. To date the implications of functions on their management by has not been identified or described in the development literature.

This study identifies how smallholder farmers' cattle management is shaped by not just one but the combination of functions, attributes, cultural norms, and development initiatives and policies. The argument of this study is that exploring these aspects separately for a singular enterprise or household activity will not capture accurately how and why that enterprise is managed and this research provides an illustration of this as it relates to cattle in NTB, Indonesia. This study provides a deep and broad description of how multiple components of smallholders' livelihoods are interlinked and shape how cattle are managed. This has not been reported in the previous

literature. Some studies explore the functions and attributes of livestock in household livelihoods (e.g. Patrick, 2010; Lisson et. al., 2010; Bettencourt et. al., 2015), yet little information exists on how the functions and attributes influence the decisions of smallholder farmers on the management of their animals both for broader household needs and for production.

8.4.2. *Cattle as part of a household mixed saving strategy*

The saving function of cattle for smallholder farmers predominantly shapes the management of cattle including decisions as to when an animal is sold. As mentioned previously, the use of cattle and other livestock as a form of saving is not unique to this study (Patrick, 2010; Lisson et. al., 2010; Ng'ang'a et. al., 2018; Neudert et. al., 2015). However, what this study does highlight is the complementarity of cattle as a form of saving and that saving is a multidimensional strategy for smallholder farmers' households in NTB. The household savings comprise a portfolio of savings with a mix of forms of liquid assets that vary in total convertible value and liquidity. Depending on the amount of savings they have, and the priority and amount of money required, householders manage their savings. Cattle represent a relatively large body of saving and farmers are reluctant to liquidate the value of cattle compared to smaller amounts of saving embodied in, for example, smaller livestock and gold if the need for money does not match the value of an animal. Decisions to sell cattle are driven by financial need that at least matches the financial value of the animal.

Keeping cattle for some smallholders is a strategy to accumulate wealth, also. However, as already mentioned cattle are not a symbol of wealth in this study as they are in Bhutan (Wangchuk et. al., 2014) and Kenya (Ng'ang'a et. al., 2016). In this study farmers retain cattle including calves until they have a need that requires them to sell the animal. However, the capacity to keep cattle differs between farmers. The difference is due to varied circumstances such as the capacity of labour, access to forage, and diversity of social norms in accessing forage.

8.5. Dynamics around social function of cattle in shaping the management

Cattle are one of the common means of investment or saving among the smallholder farmers in NTB Indonesia. However, how cattle are managed varies across social groups, households and household members. The diversity of conditions is related to different amounts of funding to own cattle, the need of labour, or decisions around who will farm the cattle. An arrangement of a traditional shared farming system (*kadas-in* and *kadas-out*) is an informal institution that facilitates mutual benefits for both cattle owner and carer. The *kadas* arrangement is chosen by some people to overcome problems such as: limited funding to own or buy cattle. Shared farming enables poorer farmers to own cattle or to increase the number of cattle they own not by purchasing but by looking after other people's cattle. The carers provide facilities for farming cattle including labour, nutrition, and healthcare. This is beneficial for poor people as carers because they can own and invest in cattle without cash. Carers and owners receive the benefits from this arrangement through the productivity attributes of cattle. The productivity attribute is defined by some scholars (Dorward et. al., 2003; Dorward et. al., 2005) as the nature of cattle to have production flows. In this study, the cows under the shared farming produce calves, which are shared based on the agreement between both parties. For the male cattle, the split is based on the price of cattle when they are sold (it is 50:50 between owner and carer) reflecting the convertibility function of cattle. Shared farming is more common than hiring labour in NTB (including in this study), and other parts of Indonesia, and it is a types of social norm in livestock farming (Sayuti, Zaini, & Taquiuddin, 2014; Lestari & Triwahyuni, 2014). Hence, people who want to invest in cattle but do not have available labour can find carers who are willing to share farm.

Some cattle owners that do not have labour for farming cattle chose to share farm (*kadas-out*) in order to keep investing in cattle. However, shared farming (*kadas*) is not only between cattle owners and poor farmers as carers. Management of cattle for cattle owners also involved a decision as to whom they will ask to raise and care for their cattle. For some owners, labour is important but sustaining their savings invested in

cattle is also important. Some better-off and experienced carers are preferred by the cattle owners than share farming with poor carers. The better off carers are willing to look after others' cattle because the owners are family or relatives. The shared farming arrangement provides an example of the decision as to who is trusted to raise cattle and protect and sustain the savings embodied in the cattle. From the perspective of owners, the criteria of carers they seek are those they consider as trustworthy and experienced in farming cattle. This finding is a new perspective because previous studies do not provide detail on the criteria of carers chosen by cattle owners in Indonesia (Utami & Seruni, 2013; Lestari, 2014).

The saving function applies for both carers and owners in the *kadas* system of shared farming. For both parties, cattle are not the main source of income. Both parties have other income activities that provide them with the income to fulfil daily consumption needs. Cattle are sold when they need cash that is equal to the value of their own cattle. The difference between carers and cattle owner lies in terms of when to sell cattle and who decides to sell cattle. The need of carers and owners to sell cattle is different, and decisions to sell can be made by both carers and owner. Both owners and carers can sell their cattle when they need money. Yet, carers also can decide to sell owners' cattle when they think that the number of cattle exceeds the labour capacity. The carers tell the owners about their decisions to sell cattle.

Some studies on shared farming have been conducted in Indonesia (Utami & Seruni, 2013; Lestari & Triwahyuni, 2014). However relatively few studies internationally have explored shared farming. From the existing literature, none of the studies explored the aspect of shared farming from the perspective of functions and attributes of a commodity as well as how carers shape how cattle are managed. The information that is provided by the literature (Utami & Seruni, 2013; Lestari & Triwahyuni, 2014) focus on the rules of shared farming between development agencies and carers, the economic benefits of the shared farming system for poor farmers, and the production function of cattle in the shared farming system rather than broader livelihood of poor farmers who are the target of shared farming programmes. The existing studies do not explore details on how assets, attributes, and activities shape carers' or owners' decisions to own, buy, sell, retain, and farm cattle. In addition to the social function embodied in the

kadas system, the social function of cattle is related to religious and cultural ceremonies (worship to God), and social obligations (providing bride wealth and social ceremonies). This finding confirms a finding in Timor Leste about social obligation (Bettencourt et al., 2015) and extends it into how a social function shapes the management of cattle. Basically, the main function of cattle is saving. However, there are social obligations that require cattle smallholder farmers to use their cattle to fulfil this function. Smallholder farmers in this study have several considerations to use their cattle for this function:

Participating in religious ceremonies is not a social obligation requiring smallholder farmer's households to sacrifice cattle no matter the number of cattle they own or their household circumstances. Religious ceremony participation is not compulsory. Farmers will not sacrifice cattle if they only own a few cattle. Smallholder farmers slaughter their cattle when they feel confident and secure with the number of cattle they have for productive saving and financial security. Thus although it is not compulsory having the ability to sacrifice an animal is reflective of a position of resilience and financial security and engenders it could be argued a sense of fulfilment in being able to illustrate and align with the religious significance of sacrificing an animal. There is literature that identifies the relations between religious ceremonies and cattle (Patrick, 2010; Waldron et al., 2013). However, the studies explore this from the perspective of the market. That is how religious festivals shape markets (trends of price, demand, and supply). There are no studies that have reported that farmer's religious beliefs and desire to worship their God shapes management of cattle and decisions as to when to sell or buy cattle.

This study extends the work on social obligation referred to by Bettencourt et al. (2015). Social obligation is defined as the expectation of a society about how a social event (celebration) should be done. This study provides an example or detail of how social obligation influences smallholder farmers' decisions to sell or slaughter cattle and why. A household will slaughter cattle for food to present to people who attend a wedding ceremony or to provide bride wealth. In this study, the social obligation on wedding ceremony or bride wealth is a norm that has social sanction (injunctive norm) when people do not conform to it. This is also an example provided in this study about injunctive norm (Frese, 2015) in which not conforming to a social expectation may cause a person to receive social sanctions such as being an object of gossip. In this study,

slaughtering cattle is an example of social obligation that has injunctive value. The implication of this norm is that farmers prioritise their cattle to fulfil this function to avoid social sanctions. Farmers have concern that if they do not provide meat or bride wealth, people will speak badly of the farmer and their family, and people will not respect the wedding. This makes smallholder farmers willing to sacrifice their cattle investment to meet this social obligation if they can.

Another decision around management of cattle is related to the number of cattle owned/managed which was not recognised as an indicator of social status in this study as has been reported in other studies (Ng'ang'a et. al.; 2018; Neudert et. al., 2015). However, the more cattle a family were able to offer for sacrifice at religious events or slaughter for food at a family wedding was evidenced as reflecting positively on the farmer households. The capital gained from cattle in these instances is grounded in interrelated religious and social beliefs based on giving and generosity and reflects Islamic religious beliefs.

8.6. The roles of socio-cultural norms in shaping the cattle farming

Socio-cultural norms including gendered norms shape the management of cattle in this case study, a finding consistent with other studies linked to the management of cattle, farming, and marketing livelihoods in other countries (Njuki & Sanginga, 2013; Kristjanson et. al., 2014). The norms do not shape cattle management through differentiations of functions or attributes but through the impact of norms on smallholder farmers' access to fodder for cattle and, consequently, access to the informal institutions of share farming that enable the enhancement of smallholder farmers' assets.

In this study, one social group (the Transmigratory farmers) did not access common grazing land (source of forage) and this therefore limited the number of cattle they were able to sustain compared to the other group (the Local farmers) who did access the grazing lands. This is slightly different from a finding in India where it is reported that the difference in available labour of groups with different social cultural backgrounds

shaped the functions and attributes of cattle (Kent & Dorward, 2015). The differences between social groupings and the management of cattle have likewise been identified by Kent and Dorward (2015) in India. However, in India the differences related to availability of labour to care for cattle linked to household circumstances and the availability of labour in the community. Although availability of labour influenced management of cattle in this research the distinctions between social groups reflected social norms rather than differing household circumstances.

Gender is also highlighted in this research as shaping the management of cattle through its association with differing access to forage and a need for men to manage certain classes of cattle (bulls). The ability of men and women to accumulate cattle differs in this study. Gender norms determine access to forage and how many cattle can be maintained by men and women. Different access to the common grazing land results in women's ability to access forage being far less than men. There is a social expectation and acceptance that women should take care of domestic chores first before traveling away from home to collect fodder. When male labour is not available in woman-headed households, the household has a more limited ability to access and gather fodder and therefore accumulate and care for cattle. This finding confirms previous literature that patriarchy makes women's access to productive assets including cattle different from men (Njuki & Sanginga, 2013; Meinzen-Dick et. al., 2014). In this research limitations on the access to fodder for cattle means women are limited in their ability to save using cattle but also they are limited from increasing their wealth through the *kadas* system. This finding is in line with the finding of Markel, et. al. (2016) about different roles of men and women in public and domestic spheres in some developing countries. However, the literature has not yet portrayed the aspects of gender roles in public and domestic spheres that shape how cattle are managed.

8.7. Implications for development initiatives

This study argues that market-led rural development must focus not only on smallholder farmers' relationships with market actors but importantly the interrelated dynamics of smallholder farmers' livelihood portfolios and the institutions that frame these dynamics. As has been suggested by other scholars (Challies & Murray, 2011;

Elizondo, 2017, Scoones 1999; 2009; DFID UK, 1999) this research illustrates how the sustainable livelihood framework can be employed to examine smallholder farmers' livelihoods and inform the design and implications of rural development interventions.

This research suggests that development initiatives be targeted at functions on which livelihoods are dependent rather than a single enterprise of productive activity. As was highlighted in this research policies not directly targeting cattle but targeting the functions fulfilled by cattle resulted in smallholder farmers retaining and not selling cattle and thereby supporting the intent of the market-led initiatives being promoted in the area. This is also supported by Ndoro and Hitayezu (2014) whose research in South Africa also identified that farmers' decisions around cattle were not solely driven by productivity and exchange. This is an outcome that aligned with the overall intent of the Government market-led initiative for cattle in NTB. Smallholder farmers whose medical needs were covered by health insurance no longer needed to sell cattle to finance medical treatment. Another example is that credit facilities provided by the Government to support corn farming might influence farmers to retain their cattle. This research provides a clear illustration of the value for achieving development outcomes in targeting accurately mechanisms that influence the functions of assets rather than the assets themselves.

Further, the dangers of assuming an asset is perceived in a certain way and smallholder farmers align with perspectives embedded in market-led approaches are likewise highlighted by this research. Changing smallholder farmers' view of cattle from one of a form of saving to one solely of production will clearly entail a fundamental shift in a complex of norms, practices, and values and will take time and a multidimensional mix of policy interventions rather than a singular focus on cattle production and market access. Evidence about this issue was also reported in a study in South Africa (Ndoro, 2014) which reported the difference between government's assumption on functions of cattle with the actual functions by farmers and how the policy become a barrier and not an enabler for cattle development.

8.8. Summary of the chapter

In this study, cattle are part of the whole smallholder farmer's livelihoods and the decisions in managing their cattle are shaped by how cattle are viewed and interrelated with other assets and activities of their livelihoods. Those are also influenced by how formal and informal institutions play out in the smallholder farmers' livelihoods. Cattle management here refers to decisions around cattle ownership, purchasing, and the number of cattle owned/managed. It involves decisions around selling, retaining, slaughtering/sacrificing cattle, as well as nutrition, healthcare and mating. For smallholder farmers in NTB, cattle primarily fulfil saving and social functions in their livelihoods rather than fulfilling the functions of production, consumption, and exchange (income). However, the smallholder farmers' reason to invest in cattle for their mixed types of saving strategy are driven by the cattle attributes of production, convertibility, and complementary.

This study provides a rich illustration about how these mixed functions, attributes, and formal and informal institutions influence how the smallholder farmers make particular decisions on their cattle. Hence, smallholder farmers' decisions on cattle cannot be captured from a single point of view. This study is evidence of how the sustainable livelihoods framework can be employed in capturing a comprehensive picture of farmer livelihoods to inform rural development intervention designs.

This study illustrates a number of points:

- 1) cattle primarily have saving and social functions. Smallholder farmers' saving strategies are varied and they manage them based on the amount of liquid asset needed and the priority. Cattle are considered as a large type of saving and it is sold when farmers need cash as much as the financial value of cattle. Cattle are retained when farmers do not need cash, except if the number of cattle exceeds the capacity to farm cattle (labour and forage availability). However, although cattle are means of saving and not for consumption, the smallholder farmers can slaughter/sacrifice their cattle to be consumed in the events of socio-cultural or religious ceremonies;

2) the attributes of functions of cattle or other livelihood assets influenced how they are managed. Other than cattle, other assets such as small livestock, gold, cash, and/or land are types of saving portfolio of smallholder farmers in NTB Indonesia. The relationships between the means of saving are complementary based on the financial value needed and the types of asset which are suitable to the value needed. Moreover, the use of assets is prioritised to the levels of liquidity of the assets for saving. How functions attributed to an asset (e.g. cattle) are shaped by social norms of the society;

3) investing in cattle is a common strategy of saving in NTB, the presence of share-farming (*kadas*) may help those who face issues in investing in cattle such as financial or labour problems to involve in this informal institution. This is considered informal because this is trust-base and unwritten agreement between the parties involved in *kadas*;

4) social norms including gender norms shape how cattle are farmed (whether grazing or non-grazing, forage collection, and labour) and, thus, how many cattle can be raised, and how farmers respond to development initiatives;

5) smallholder farmers' livelihood portfolios, including formal institutions may influence decisions around management of cattle. Hence, market-led development policies on cattle need to look at smallholder farmer livelihood portfolios more comprehensively and avoid making assumption in particular ways as expected by the policies.

This study involves a long process of identifying background and problems, determining the research question and aims of the study, exploring literature, designing research plan, collecting data, analysing, and writing up and discussing the findings. This is then concluded in the next chapter.

Chapter 9. Conclusion

9.1. Introduction

Research question that leads this doctoral study is “what shapes smallholder farmers’ management of cattle in NTB Indonesia and why?” This question is answered in-depth and systemically by using the sustainable livelihood framework. This study provides a rich illustration of, and insights into, the management by smallholders of an asset (cattle) that fulfils savings and social functions through the attributes of productivity, exchangeability and convertibility. Social norms including gender related norms specific to the socio-cultural context influence aspects of the management of cattle across social groupings, however, the functions cattle for fulfil predominate as drivers of cattle management. This also provides a comprehensive understanding on how and why smallholder farmers in NTB respond to cattle development initiatives. This chapter concludes this thesis by providing a summary of key findings, including theoretical contributions, and practical implications. Reflections on the research design and future research are covered as are policy implications of this research.

9.2. Key findings and theoretical contributions

Management as it relates to cattle is defined by the functions that cattle fulfil for smallholder farmers, and the relationship between these functions and those of other assets in smallholder’s livelihood portfolio. In NTB for smallholder cattle farmers management constitutes decisions around cattle ownership, care, purchasing, selling, retaining, slaughtering/sacrificing, as well as nutrition, healthcare and mating. Decisions relating to the purchase and sale of animals are linked to considerations of saving and the liquidation of cash to meet specific needs. Purchase and sale decisions are not driven by considerations of market demand or price as would be the case in a market-led farming approach for cattle. Consequently the focus of cattle management is not on productivity or financial returns but rather on sustaining the animal to attain a level of reproduction and growth that meets the need for saving and allows share

farming arrangements to occur. This suggests that when assets like livestock are not retained for purposes of production, consumption, or exchange market considerations are unlikely to influence farmers' management of those assets. Further, initiatives that seek to change farmers' management of the asset to reflect market-led thinking are very likely to be resisted by farmers.

This study provides examples through a case study of cattle of how sustainable livelihood framework is used to understand a comprehensive consideration regarding livelihoods in shaping smallholders' decisions on management of cattle. This study provides a rich illustration of the roles of functions attributed to cattle, their relationship with functions and attributes of other livelihood assets, and the influence of social norms in shaping smallholder farmers' decisions on ownership, care, buying, selling, retaining, and slaughtering/sacrificing cattle, as well as nutrition, healthcare and mating. For smallholder farmers in NTB, cattle fulfil saving and social functions, which farmers sell their cattle when they need cash that is equal to the financial value of cattle. Cattle are sold or slaughtered for consumption when it is related to social functions such as for social or religious ceremonies. The productive, complementary and convertibility attributes of cattle enable them to fulfil the saving and social functions for smallholder households in NTB. Moreover, smallholder farmers' decisions on management of their cattle are not only influenced by functions fulfilled by cattle for their livelihoods but also by what functions are not fulfilled by the animal. This is related to implications on distribution of labour to farm cattle and decisions around the number of cattle farmed as well as decisions on selling, purchasing or retaining cattle. For smallholder farmers in NTB, cattle fulfil saving and social functions, yet they do not fulfil consumption, production, and/or exchange (income) functions. However, smallholder farmers' preference to invest in cattle as a means of saving is driven by the attributes of cattle such as productive, complementary, and convertibility which the farmers view them as the benefits of investing in cattle. These attributes can fulfil different functions of assets. The difference in how attributes enable different functions can be the result of cultural and social norms linked to religious and social beliefs. Cattle fulfil social functions through shared-farming institutions specific to local cultural norms. Cattle also fulfil social functions by matching social obligations in

line with religious norms of sacrifice and sharing of food even when its primary function for the household is not for consumption.

Smallholder farmers have a mixed saving strategy in their livelihoods of which cattle are but one component. As cattle are primarily for saving the saving strategy of the household influences the management of cattle. The position of cattle in the saving portfolio influences smallholder farmers' decisions whether to sell, retain, or slaughter cattle. The saving portfolio contains different forms of saving of varying value and liquidity. Cattle in this strategy are of high value and consequently lower liquidity. Cattle that are used as a form of saving are not also necessarily a symbol of wealth or status which is culturally based as in Kenya (Ng'ang'a et. al., 2016), Mozambique (Ng'ang'a et. al., 2018), and Bhutan (Wangchuk et. al., 2014) which cattle are a symbol of wealth and status; however, they are not considered in that way in NTB Indonesia. Cattle fulfil a social function as a form of sacrifice and offering aligned with religious and social norms.

This study extends understanding of how attributes of cattle functions influence the management of them. This research has identified that smallholders that use livestock and other forms of savings other than banks may utilise a mix of savings that cover a range of relative value and liquidity.

Cattle fulfilling saving functions are complementary to smallholders' needs for consumption and income generation in this case the growing of corn and rice and other income generating activities. The management of cattle, therefore, was influenced indirectly by a need of smallholders to satisfy consumption or income needs using assets other than cattle. For the cattle, the smallholder farmers' focus was on sustaining the animal through the provision of fodder to maintain its reproductive capacity and growth (but not optimising this). The management and care of cattle was fulfilled using labour available after the completion of those household activities essential for fulfilling the functions of consumption and exchange (income) functions.

This study also provides some illustrations around how social norms including gender norms shape smallholder farmers' decisions on management of cattle regarding

whether to sell or retain cattle, strategies to farm cattle, or to care for cattle health. The farming system may differ in different societies, and the difference is inherited over generations. For example, the difference between grazing and practices are related to the availability of labour, forage for cattle, and hence, the decision on the number of cattle. The different preference of grazing is also associated to different responses to the availability of services provided for cattle such as the use of cattle healthcare and reproduction. The influence of gender norms in management of cattle are related to public and domestic roles as well as access to cattle development interventions between men and women, not to a distinct division of labour around the management of cattle. This study provides evidence of how different roles and access to assets and development interventions between men and women have different implications for decisions on the number of cattle they can have, and therefore, to the decisions around selling or retaining cattle.

9.3. Practical implications of this study

In policy design and implementation of cattle market-led rural development initiatives in NTB Indonesia, the nature of complexity of livelihood needs to be understood comprehensively in relation to the management of cattle by smallholder farmers. This includes dynamics around decision making as parts of the cattle management. The policy design and implementation of the market-led rural development initiatives cannot take account of factors partially, for instance, considering livelihood assets, or cattle production and marketing only. Instead, it needs to understand the function fulfilled by cattle as the target of a development programme and as an integrated part of smallholder farmers' livelihoods.

This study supports the use of sustainable livelihood framework in achieving a comprehensive understanding of potential responses of targeted communities in the implementation of market-led rural development initiatives. This is expected to find effective strategies to implement rural development policies, especially in NTB. Furthermore, this study suggests livelihoods of targeted communities (cattle farmers in NTB Indonesia) should explore deeply into functions and attributes of cattle, the relationship with other assets and activities, and the existence of formal and informal

institutions in shaping dynamics around farming cattle as well as responses to cattle development initiatives. This aims to understand in more detail how and why targeted cattle farmers make decisions to cattle programmes in the way they do to ensure effectiveness of the achievement of the development goals. More importantly this understanding can then inform the design of integrated development programmes rather than those that focus on a single enterprise and assume certain functions.

This study suggests a cattle development intervention in NTB needs to consider what functions and attributes are fulfilled as well as what are not fulfilled by cattle in smallholder farmers' livelihoods. This has the implication on the understanding gained around what potential decisions will be made by smallholder farmers when cattle have saving and social functions but not production or consumption functions. This is related to the priority of smallholder farmers' households in their livelihoods, whether to prioritise their resources to do cattle farming (cattle as a means of saving) or to do other activities as their regular income (e.g. corn farming). This is also related to decisions on whether the farmers invest their labour and financial capital on cattle farming or on other activities for regular income.

Therefore, the implementation of a market-led rural development initiative of cattle in NTB should avoid assumptions about farmers' needs. Instead, the actual needs of the targeted communities should be explored and understood comprehensively. For example, making assumptions by emphasising production and marketing of cattle rather than saving and social functions in implementation of a cattle development programme may prohibit positive responses from the targeted farmers. Cattle are one of the main commodities of NTB Indonesia. However, cattle farming for the majority of the farmers in this province are not market-led. By assuming that production and marketing as the most important rather than focusing on saving and social functions, the expected development goals will be hard to achieve. Especially, when the functions attributed to cattle by smallholders are shaped by social norms which have been passed down over generations.

Understanding and taking account of the roles of social norms including gender norms in designing and implementing cattle development policies in NTB are also important.

This aims to understand potential responses of farmers or targeted communities to the interventions being implemented. NTB has an informal institution that provides an opportunity for those who want to invest but have production constraints such as labour or financial capital to invest in cattle. This form of informal institution is cattle share-farming (*Kadas*) arrangement. Future development initiatives can recognize this as was done in Central Java (Lestari & Triwahyuni, 2014). However, it needs a more comprehensive understanding of why and how this shared arrangement works or does not work for farmers and cattle owners rather than just looking at the aspects of profit when choosing this strategy. It is necessary to study in more depth how this shared-farming (*Kadas*) arrangement can be sustainable and profitable for farmers. Another example of the potential use of this research is to find effective strategies to help farmers who graze their cattle and those who do not, because the cattle farming system is also closely related to the influence of social practices in NTB. It is also suggested that the implementation of the market-led cattle development initiatives in this province need to consider the gender aspect. Women-headed households who raise cattle can get access to grants more easily so that they can optimize their livestock production. The right support can be considered to help woman farmers to collect forage without the worries about violating social norms or alternative sources of fodder being provided.

More broadly, this research illustrates the complex interrelated nature of smallholder's livelihood activities and the diversity of values placed on assets and how this shapes their management by smallholder farmers. This also highlights why smallholder farmers may not respond to initiatives that focus on only one enterprise and fail to acknowledge the existing values placed on the assets used in that enterprise by smallholder farmers. This research argues for the need for the design and implementation of initiatives to be grounded in an understanding of the place and function of enterprises in smallholders' livelihoods. The potential for encouraging community driven initiatives and seeking high levels of smallholder engagement in the design of local initiatives is highlighted by the research, also.

9.4. Theoretical contribution of the research

The value of extending the sustainable livelihood framework (DFID UK, 1999) to include a consideration of asset functions and attributes (Dorward et al., 2001; Dorward et al., 2005; Kent & Dorward, 2015) is confirmed by this research. The dynamics that influence smallholders' management of enterprises and their response to development initiatives targeting a particular enterprise is enriched through exploring asset functions and attributes and their relationships with other assets and their functions. Considering asset functions and attributes are shown to make explicit the complex inter-relationships reasons between assets and livelihood activities. This understanding provides greater clarity as to why farmers make the decisions they do, manage assets and respond to development initiatives in the way they do.

Many studies into the management of assets such as livestock, including cattle, tend to assume that all farmers are driven by market related variables and that livestock are valued only for market related functions linked to productivity (Patrick, 2010; Lisson et.al., 2010; Ng'ang'a et. Al., 2018; Neudert et.al., 2015). The focus of these studies tends to be on increasing productivity, with little recognition given to the complexity and interlinked nature of livelihood activities and the diversity of values smallholder farmers place on livestock. The narrow focus of these studies, this research suggests, cannot reflect the multiple dimensions farmers bring to the management of their livestock.

Saving is a strategy employed by smallholder households that is linked to assets with attributes of productivity and convertibility (Dorward et al., 2001; Dorward et al., 2005; Kent & Dorward, 2015) including cattle. This research extends existing theory by showing that the saving strategy of smallholders is based around a portfolio of forms of saving that vary in terms of relative value and liquidity. In this research the portfolio includes a variety of forms of livestock, gold, jewellery and cash. The management of the assets that comprise the saving portfolio are linked to their relative position within the portfolio and the needs of the household for money and this dynamic has not been previously acknowledged in the literature.

Attributes that may be generally associated with an asset, for instance, livestock and productivity are not in all contexts associated with expected functions of consumption and/or income generation. Sociocultural norms of smallholder farmers can influence the relationship between attributes and functions such that the focuses of development initiatives do not align with smallholders' approaches to that asset. An asset with certain attributes may be valued in diverse ways in different contexts that will mean the management of that asset by farmers will vary. Therefore, assumptions associated with an asset based on one context may not align with those in another context.

This study also identified that levels of wealth are not always related to the accumulation of a particular asset possessed by someone or a household. Yet, the type of asset being accumulated may depend on social norms that shape what is considered being wealthy. In Bhutan (Wangchuk et. al., 2014) and Kenya (Ng'ang'a et. al., 2016), cattle are the standards of wealth as well as means of saving, while in this research, cattle are means of saving but they are not necessarily the measurement of wealth in both societies.

Informal share farming arrangements (such as Kadas) are an example of an informal institution that constitutes a form of social capital (Sayuti, Zaini, & Taquiuddin, 2014) as it facilitates a complementary relationship between parties. This research highlights the relationship between the attributes and functions of an asset and how this enables the informal institution for share farming. The productivity attribute of cattle along with the saving function of cattle combine to enable the informal institution of kadas (share-farming arrangement). This mechanism based on this attribute and function enables farmers who wish to retain cattle but lack labour to do so by partnering with other farmers who have labour and seek to increase the number of cattle they own. The dynamic of both saving and productivity associated with cattle is fundamental to these arrangements and therefore its link to social capital also.

Gender norms do not shape management of an enterprise through differentiations of functions or attributes but through the impact of norms on smallholders' access to resources in enterprise development that enable the enhancement of smallholder farmers' assets. For example, accumulation of cattle is shaped by different access of men

and women to fodder. Other scholars have identified differences in cattle ownership of men and women due to differential access to resources similar to what has been found in this research (Njuki & Sanginga, 2013; Kristjanson et. al., 2014).

Social obligations shape smallholders' management of asset (Bettencourt et. al., 2015). It is identified that smallholders' decisions around their asset may be shaped by social functions of the asset (e.g. cattle), which are may be part of social obligations and/or personal or religious beliefs of smallholders.

In terms of an enterprise production, social norms also shape decisions on the size of smallholders' enterprise because different societies have different values or norms in accessing resources and the ways or norms of production. For example, the smallholders from different social groups in this study had different norms of accessing fodder for their cattle. Therefore, the smallholders had different labour availability, and hence, different decisions on the number of cattle. This provides a different perspective from Kent and Dorward (2015) who look at the difference in available labour of groups with different social cultural backgrounds which shaped the functions and attributes of an enterprise.

9.5. Future Research

The market-led agenda is being pursued for agriculture in many developing countries including Indonesia. Future research that explores a similar research question for different commodities and productive assets would extend understanding of the dynamics that shape the management of these commodities by smallholder farmers and inform development policy. For example, the management of small livestock (goats, or chicken), dairy, or crop farming as part of an integrated livelihood system could be explored in Indonesia. Future research could also explore the management of cattle in Indonesia when they fulfil more or different functions than merely saving and social functions, or fulfil mixed attributes like cattle in NTB in this research.

The development of Horticulture in North Lombok in NTB Province of Indonesia has expanded over the last few years and has potential to improve the livelihoods and income of smallholder farmers in this area. It has also been shown to assist smallholder

to recover an income and food source relatively quickly following shocks like the Lombok earthquake in 2019. Research could explore the characteristics and attributes of the development of horticulture to assist inform policy initiatives that seek to assist smallholder farmers recover from the impact of Covid-19 in countries like Indonesia.

A chilli development programme in Indonesia received a lot of support from the Government to supply national demand for chilli, especially during Covid-19. In order to support production and distribution, the Government cooperated with various start-up companies in online marketing. Hence, it was claimed that Covid-19 did not hinder chilli farmers to increase in production, supply to markets or income generation. However, how these initiatives were operationalised and the implications for the smallholder farmers in Indonesia have not been researched formally. Therefore, there is a potential opportunity to do comprehensive study around how market-led development in Indonesia can give sustainable benefits for smallholder farmers. Moreover, there are opportunities to expand the study by using market-led framework (e.g. value chain analysis framework) together with the sustainable livelihood framework in order to explore how complex rural livelihoods shape farmers' positions in value chains of an agricultural commodity.

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Appendices

Appendix A

Interview Protocol

Research aims:

Better understand of how rural livelihoods influenced management of cattle:

- Unpack complexity of rural livelihoods which includes MLRD in NTB
- How & why management of cattle are shaped by farmers' livelihoods and broader system including MLRD in NTB

There are 6 (six parts in this protocol). Those are groups of participants (A-E) and further probing questions (F).

A. Farmer groups:

Background

- Roles of family in a household's livelihoods in general
- Common income generation activities
- Cattle's value in farmers' household livelihoods
- Cattle production system
- Roles of male and female in family and community in cattle and other livelihood activities?

Livelihoods:

- Assets (how to utilise: own or borrow or access for free? How to get them?)
 - ✓ human,
 - ✓ social,
 - ✓ financial,
 - ✓ natural
 - ✓ physical capital)
 - ✓ How the assets influence your livelihood (including cattle production) activities and why?

- Transforming structures and processes
 - (Structures: socio-cultural norms, rules, other kinds of institutions, organisations, etc)
 - (Processes: how the structures operate?)
 - ✓ Existing structures:
 - ✓ Processes: BSS programme interventions
 - ✓ How do those structure and processes influence your cattle production and overall livelihood? Why?
- Strategies
 - ✓ How do people access, own and manage their assets?
 - ✓ Do you separate your assets for each income activity or do the utilisation of the assets overlapped?
 - ✓ How do the existing assets and TSP influence your livelihood strategies for income generation activities including your cattle production?
- Outcomes (how and why better, worse, or the same?)
 - ✓ What are the reasons of selling your cattle?
 - ✓ What do influence price of cattle?
 - (Who do determine the cattle price? How is the cattle price determined and why?)
 - ✓ How do you get the cattle price information?
 - ✓ What kinds of programmes or interventions regarding cattle markets did you receive from government or other agencies?
 - ✓ Are they parts of BSS?
 - ✓ How are the interventions implemented? How those interventions impact your cattle production?
 - ✓ Who did buy your cattle?
 - ✓ How are the relationships between you and the buyers?
 - ✓ And how is the nature of the relationship between you and other cattle farmers? Probing:
 - bargaining positions,
 - communication,
 - collective action,
 - etc

- ✓ Benefits of becoming group member? Why?
- ✓ Problems faced by the group members? Why?
- ✓ Solutions for problems within group member? Why?
- ✓ Roles of group leaders?
- ✓ What kinds of value-added activities have been done for your cattle production?
- ✓ How do you do the activities? Why?
- ✓ Who do take roles in the activities? (family members or other stakeholders)
- ✓ Do you receive the cattle development interventions from governments or other agencies?
- ✓ How people respond to the activities?
- ✓ Are the programmes parts of BSS? How did you know?
- ✓ What are the outcomes of the interventions have been gained (what have been changed) and what are the following-up activities?

B. Farmers and a family member of each farmer's household

Background:

- Tell me about you and your family
- Assets (how to utilise: own or borrow or access for free? How to get them?)
 - ✓ human,
 - ✓ social,
 - ✓ financial,
 - ✓ natural
 - ✓ physical capital)
 - ✓ How the assets influence your livelihood (including cattle production) activities and why?
- Transforming structures and processes
(Structures: socio-cultural norms, rules, other kinds of institutions, organisations, etc)
(Processes: how the structures operate?)

- ✓ Existing structures:
- ✓ Processes:
- ✓ How do those structures and processes influence your cattle production and overall livelihood? Why?
- ✓ Roles of male and female in family and community?
- Strategies
 - ✓ How do you manage your assets?
 - ✓ Do you separate your assets for each income activity or do the utilisation of the assets overlapped?
 - ✓ How do the existing assets and TSP influence your livelihood strategies for income generation activities including your cattle production?
- Outcomes (how and why better, worse, or the same?)
 - ✓ better income,
 - ✓ improved well-being,
 - ✓ reduced vulnerability (more stable),
 - ✓ sustainable natural resources,

Market Chains

- a. Governance, probing:
 - ✓ What are the reasons of selling your cattle?
 - ✓ What do influence price of cattle?
(Who do determine the cattle price? How is the cattle price determined and why?)
 - ✓ How do you get the cattle price information?
 - ✓ What kinds of programmes or interventions regarding cattle markets did you receive from government or other agencies?
 - ✓ How are the interventions implemented? How those interventions impact your cattle production?
- b. Network:
 - ✓ Who did buy your cattle?
 - ✓ How are the relationships between you and the buyers?

- ✓ And how is the nature of the relationship between you and other cattle farmers? Probing:
 - bargaining positions,
 - communication,
 - collective action,
 - etc
 - ✓ Benefits of becoming group member? Why?
 - ✓ Problems faced by the group members? Why?
 - ✓ Solutions for problems within group member? Why?
 - ✓ Roles of group leaders?
- c. Value-added
- ✓ What kinds of value-added activities have been done for your cattle production?
 - ✓ How do you do the activities? Why?
 - ✓ Who do take roles in the activities? (family members or other stakeholders)
 - ✓ Do you receive the cattle development interventions from governments or other agencies?
 - ✓ How people respond to the activities?
 - ✓ Are the programmes parts of BSS? How did you know?
 - ✓ What are the outcomes of the interventions have been gained (what have been changed) and what are the following-up activities?

C. Farmer group leaders, Formal/informal leaders among the communities

Background:

- ✓ Tell me about you and your family
- ✓ How long are you in this position? (a leader)
- ✓ Why people chose you?
- ✓ Do you raise cattle? Why? How do you manage them?

Sustainable livelihoods including the context of the cattle market-led development initiative:

- a. Assets (human, social, financial, natural and physical capital)
 - What are the roles of farmer groups in helping farmers to access assets?
 - How do assets influence people's livelihood (including cattle production) activities and why?
- b. Transforming structures and processes
 - What are the existing structures and processes (such as institutions and organizations including collective actions) that influence people's livelihoods?
 - How is the nature of existing structures and processes that influence people's livelihoods and why? (
 - If a collective action in cattle production and marketing have existed:
 - How does the CA benefit cattle farmers?
 - What problems are faced by farmers? And how to overcome the problems in the CA?
 - What are the strategies to support farmers in taking benefits from the CA (internal and external factors)?
- c. Strategies
 - What strategies are implemented to improve people's livelihoods?
 - How existing assets and TSP influence people's livelihood strategies for income generation activities including cattle production?
- d. Outcomes (i.e. better income, improved well-being, reduced vulnerability, sustainable natural resources, including the benefits of CA)
 - What outcomes have been achieved from the existing TSP's activities? How are the outcomes achieved?
 - What do you think about livelihoods of smallholder cattle farmers in the two villages recently? Why you say their livelihoods have been better, the same or worse?

Market Chains:

- a. Governance, probing:
 - What are the roles of the group or existing communities in helping cattle farmers to access markets?
 - What are the roles of the group or existing communities in providing farmers with cattle price information?
 - What kinds of programmes or interventions regarding cattle markets did people receive from government or other agencies?
 - How have the interventions been implemented? How those interventions impact the cattle production?
- b. Network:
 - How is the nature of relationships between farmers and buyers as well as among cattle farmers? What are the roles of farmer groups?
 - What are the roles of the farmer groups/existing communities in helping cattle farmers in the cattle marketing? (Probing: bargaining positions, communication, collective action, etc.)
- c. Value-added
 - What are the roles of the farmer group in value-added activities including in cattle production?
 - Do cattle farmer receive the interventions from governments or other agencies?
 - How people respond to the activities?
 - What are the outcomes of the interventions have been gained (what have been changed) and what are the following-up activities?

D. Buyers, slaughterers and meat sellers

Background:

- Tell me about you and your family
- Assets (how to utilise: own or borrow or access for free? How to get them?)
 - ✓ human,
 - ✓ social,

- ✓ financial,
 - ✓ natural
 - ✓ physical capital)
 - ✓ How the assets influence your livelihood (including cattle production) activities and why?
- Transforming structures and processes
 - (Structures: socio-cultural norms, rules, other kinds of institutions, organisations, etc)
 - (Processes: how the structures operate?)
 - ✓ Existing structures:
 - ✓ Processes:
 - ✓ How do those structures and processes influence your cattle production and overall livelihood? Why?
 - ✓ Roles of male and female in family and community?
- Strategies
 - ✓ How do you manage your assets?
 - ✓ Do you separate your assets for each income activity or do the utilisation of the assets overlapped?
 - ✓ How do the existing assets and TSP influence your livelihood strategies for income generation activities including your cattle production?
- Outcomes (how and why better, worse, or the same?)
 - ✓ better income,
 - ✓ improved well-being,
 - ✓ reduced vulnerability (more stable),
 - ✓ sustainable natural resources,

Market Chains:

- a. Governance, probing:
 - How to find the farmers who want to sell their cattle?
 - What do influence price of cattle?
 - (Who do determine the cattle price? How is the cattle price determined and why?)

(Probing: bargaining positions, cattle price information, communication, etc.)

- What kinds of programmes or interventions regarding cattle value chain development did you receive from government or other agencies?
- How are the interventions implemented? How those interventions impact your cattle business?

b. Network:

- Who did you buy your cattle?
- How is the nature of relationships between you and the farmers?
- What are the nature of relationships between you and other buyers? Who did you sell the cattle? How did you sell?
- Why do you choose this business?

(Probing: bargaining positions, communication, collective action, etc)

c. Value-added

- What kinds of value-added activities have been done for your cattle?
- How did you do the activities? Why?
- Who do take roles in the activities?
- Do you receive the interventions from governments or other agencies that related to value-added in your cattle trading activities? How are those implemented and why?

- d. What are the outcomes of the interventions have been gained (what have been changed) and what are the following-up activities?

E. Government (Industry and Trading Dept, Livestock Dept., Cooperative Dept.), field officers and head of villages,

Background:

- Tell me about you and your family
- Do you raise cattle? Why? How do you manage your cattle production?

Sustainable livelihoods:

- a. Assets (human, social, financial, natural and physical capital)
 - What kinds of assets provided for the cattle farmers in the two villages?
 - How can they access the assets?
- b. Transforming structures and processes
 - What are existing structures and processes that influence farmers' livelihoods? (E.g. institutions and organizations)
 - How do the existing TSP influence farmers' livelihoods and why?
- c. Strategies
 - How do you help farmers manage their assets?
 - What are the interventions have been implemented regarding smallholder cattle farmers' livelihoods in the two villages?
 - How are those programmes or interventions implemented and why?
- d. Outcomes (i.e. better income, improved well-being, reduced vulnerability, sustainable natural resources, including the benefits of CA)
 - What have outcomes been achieved from the interventions or programmes
 - How are the outcomes achieved?
 - Why do you say the current farmers' livelihoods have been better, the same or worse livelihoods?

Market Chains:

- o Governance, probing:
 - i. What kinds of cattle value chain interventions have been implemented that include the smallholder cattle farmers in the two villages? (Probe: price, market information, quality and quantity of cattle).
 - ii. Who, how and why the cattle value chain is governed that relate to the farmers, which include cattle value chain in the both villages?
- o Network:
 - i. How is the nature of the cattle value chain that involves the two villages?
 - ii. Who are the actors in the cattle value chain? (from producers to end markets)
 - iii. Who are the stakeholders that influence the cattle value chain?
 - iv. What are the roles of the stakeholders?

- v. What are the nature of the relationships between actors and other stakeholders in the cattle value chain?
(Probing: bargaining positions, communication, collective action, etc.)
- o Value-added
 - i. What kinds of value-added activities have been put in place that includes the two villages?
 - ii. How have the interventions been implemented? Why? Who did them?
 - iii. Who do receive the interventions?
 - iv. How do people respond to the activities?
 - v. What are the outcomes of the interventions? How are the measurements of the outcomes of the interventions? And what are the following-up interventions to support cattle value chain?

F. The additional list for probing: Factors influence access to markets

1. Access to technology and innovation
2. gender roles in the cattle farm management
3. formal and informal institutions (including culture, values and norms, religious believes, family's life, people's participation in programmes' implementation, community platforms, cooperative and collective actions)
4. physical infrastructure
5. Distance to markets
6. contract farming
7. transaction costs
8. Scale of farm business/enterprises and the impacts for farmers' cattle production
9. social capital or network and organizations or structures

Appendix B

1. Information sheets (English version)

Information sheet for interviewees

Researcher introduction:

The researcher, Yulia Yanuartati, is a doctorate student of the Institute of Agriculture and Environment, Massey University, New Zealand. This research project is conducted in order to fulfil one of the requirements for Doctor of Philosophy in Agriculture. The researcher is under the supervision of Dr. Janet Reid and Dr. David Gray, who are affiliated with the Institute of Agriculture and Environment.

Project description and invitation

You are cordially invited to participate in the research project entitled “What shapes smallholder farmers’ management of cattle in NTB Indonesia and why?” This research aims to 1) better understand of how and why smallholder farmers’ livelihoods and broader systems influence management of cattle; 2) inform future rural research and development around management of cattle from the perspective of sustainable livelihoods. The research findings will be beneficial to inform the future development interventions to smallholder farmers to help them become more market-led.

Participant’s identification and recruitment

Please be aware that the smallholder cattle farmers’ households for this research have been selected based on the criteria such as (1) male/female head of households, (2) number of cattle owned by the farmer households. Furthermore, there are also several other participants are interviewed in this study who may give relevant information to meet the aims of this research. They are individual and both from governmental and non-governmental institutions. The purpose has been to involve various scales of cattle farmers and other stakeholders that may influence the cattle farmers’ livelihoods.

Project procedures

You are kindly requested to participate voluntarily in the interview for not more than 2 hours. You are kindly requested to provide information on cattle development programmes, cattle

marketing and your livelihoods. The interview will be recorded under your agreement. A consent form is provided before the interview.

A research assistant is recruited to help the researcher for translation and guidance in the sites. To ensure the data confidentiality, the assistant is trained and required to sign confidentiality agreement.

Participant's rights

You are under no obligation to accept this invitation. If you decide to participate, you have the rights to:

- decline to answer any particular question;
- withdraw from the study at any time;
- ask any questions about the study at any time during your participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- ask for the audio tape to be turned off at any time during the interview.

Data management

The information provided by you will be used for analysis and interpretation. The record of interviews will be transcribed by the researcher herself. The researcher will ensure that the information from the interviews and documents will be kept confidentially for at least five years. The record and the transcriptions of interviews will be saved in three different password-locked storage devices for the back-up. The hardcopy documents will be kept in a locked cabinet. The soft copy data will be deleted and the hard copy document will be destroyed permanently in up to five years. The confidentiality of the data is ensured by Massey University.

If you have any query with regard to this research, please contact the researcher or her supervisors in the address mentioned below:

Mobile number (Dr. Ir. Muktasam): +62 818366695

Mobile number (Prof. Ir. Taufik Fauzi, PhD): +62 818363192

The researcher's mobile number in Indonesia: +62 81353441144

The researcher can be contacted in the Faculty of Agriculture, the University of Mataram, Jl. Majapahit no.62 Mataram.

Low risk notifications:

"This project has been evaluated by peer review and judged to be low risk. Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Dr Brian Finch, Director (Research Ethics), email humanethics@massey.ac.nz. "

2. Information sheets (Indonesian version)

Lembar informasi penelitian

Tentang Peneliti:

Nama saya Baiq Yulia Yanuartati. Saya adalah mahasiswa S3 di Jurusan Pertanian dan Lingkungan, Universitas Massey, New Zealand. Penelitian ini merupakan salah satu persyaratan untuk meraih gelar doktor di bidang Pertanian. Dalam penelitian ini saya berada di bawah bimbingan Dr. Janet Reid dan Dr. David Gray dari jurusan yang sama, yaitu Jurusan Pertanian dan Lingkungan, Universitas Massey, New Zealand.

Deskripsi kegiatan penelitian dan undangan

Anda kami undang untuk berpartisipasi dalam penelitian ini yang berjudul: "Apa saja yang mempengaruhi manajemen ternak sapi dalam pengembangan ternak sapi konteks pengembangan masyarakat perdesaan yang berbasis pasar? Studi kasus di Kabupaten DOmpu, Nusa Tenggara Barat, Indonesia."

Provinsi Nusa Tenggara Barat (NTB) merupakan salah satu daerah penghasil ternak sapi di Indonesia. Sehingga NTB menjadi salah satu prioritas pengembangan sapi baik oleh pemerintah pusat maupun pihak-pihak lain. Program Sapi-Jagung-Rumput Laut (PIJAR) dan

Bumi Sejuta Sapi (BSS) merupakan contoh program unggulan pemerintah dalam hal pengembangan ternak sapi di provinsi ini. Tujuan dari program pengembangan sapi ini bukan hanya sekedar meningkatkan produksi sapi, namun juga untuk memperbaiki penghidupan para peternak sapi. Berbagai bentuk kegiatan telah diimplementasikan untuk mencapai tujuan tersebut. Berdasarkan laporan pemerintah NTB, jumlah produksi sapi di NTB telah meningkat, namun sedikit laporan mengenai bagaimana dampaknya terhadap penghidupan peternak sapi di NTB ini. Oleh karena itu, penelitian saya bertujuan untuk mengetahui bagaimana penghidupan peternak sapi secara umum termasuk program pengembangan ternak sapi di NTB membentuk atau mempengaruhi manajemen pengembangan ternak sapi dalam rumah tangga petani kecil. Kami bermaksud mengundang Bapak/Ibu untuk berpartisipasi dalam penelitian ini.

Partisipasi dan cara pemilihan partisipan

Untuk diketahui bahwa dalam penelitian ini, peternak yang diundang untuk berpartisipasi dipilih berdasarkan kriteria sebagai berikut: (1) laki-laki/perempuan dalam rumah tangga peternak, (2) jumlah sapi yang dipelihara dalam rumah tangga peternak.

Selanjutnya, para partisipan lain yang akan diwawancarai dalam penelitian ini adalah orang-orang yang dapat memberikan informasi yang relevan dengan tujuan dari penelitian ini, diantaranya yaitu individu baik dari institusi pemerintah maupun non-pemerintah. Maksud dari pemilihan partisipan ini adalah untuk melibatkan berbagai skala usaha peternakan sapi di desa-desa yang masuk dalam studi ini, serta melibatkan para stakeholder lainnya yang mungkin mempengaruhi penghidupan para peternak sapi.

Prosedur pengumpulan data

Bapak/Ibu dimohon untuk berpartisipasi secara sukarela dalam proses penelitian ini (wawancara atau menyediakan dokumen). Beberapa informasi penting yang kami harapkan dari Bapak/Ibu adalah yang terkait dengan program-program pengembangan ternak sapi, pemasaran sapi dan penghidupan Bapak/Ibu serta penghidupan para peternak sapi. Dialog kita akan kami rekam jika Bapak/Ibu mengizinkan. Berdasarkan peraturan dari Universitas Massey, persetujuan Bapak/Ibu diberikan dengan memberikan tanda tangan persetujuan pada dokumen yang telah kami sediakan.

Peneliti didampingi oleh seorang asisten untuk membantu peneliti menerjemahkan dari bahasa daerah ke Bahasa Indonesia. Selain itu, beliau menjadi pemandu lapangan bagi peneliti. Untuk menjaga kerahasiaan informasi yang diberikan oleh para partisipan, asisten peneliti telah diberikan pembekalan dan juga diminta untuk menandatangani perjanjian untuk menjaga kerahasiaan informasi yang diberikan oleh partisipan.

Hak-hak para partisipan

Bapak/Ibu tidak dipaksa untuk berpartisipasi dalam penelitian ini. Jika Bapak/Ibu bersedia untuk berpartisipasi, Bapak/Ibu berhak untuk:

- Menolak menjawab pertanyaan-pertanyaan tertentu;
- Menanyakan pertanyaan apapun terkait dengan penelitian ini kapanpun selama masa partisipasi Bapak/Ibu dalam penelitian ini;
- Dijaga kerahasiaan nama dan identitas Bapak/Ibu terkait dengan informasi yang diberikan, kecuali jika Bapak/Ibu bersedia namanya ditampilkan;
- Meminta agar tape recorder untuk dimatikan kapanpun selama wawancara.

Manajemen data

Informasi dari Bapak/Ibu akan kami analisa dan interpretasi. Rekaman wawancara dengan Bapak/Ibu akan ditulis (dibuat transkrip) oleh peneliti. Peneliti akan memastikan bahwa informasi yang diperoleh baik rekaman usara maupun dokumen tertulis akan disimpan dan terjaga kerahasiaannya selama 5 tahun. Data softcopy akan disimpan dalam 3 (tiga) tempat penyimpanan yang terkunci dengan password. Sementara untuk data hardcopy akan disimpan dalam cabinet yang terkunci rapat. Semua data akan dimusnahkan maksimum dalam 5 (lima) tahun. Kerahasiaan dari data dijamin oleh Universitas Massey, New Zealand.

Jika Bapak/Ibu memiliki pertanyaan mengenai penelitian ini, silahkan kontak peneliti atau pembimbing lapangan di nomer yang tertera di bawah ini:

Dr. Muktasam: +62 818366695

Janet Reid: J.I.Reid@massey.ac.nz

Peneliti: +62 81353441144

Peneliti dapat dikontak di Fakultas Pertanian, Universitas Mataram, Jl. Majapahit no.62 Mataram.

Pernyataan penelitian beresiko rendah

“Studi ini telah dievaluasi oleh peer review dan juri sebagai penelitian yang beresiko rendah. Oleh karena itu, ini belum direview oleh salah satu dari Komite Kode Etik. Peneliti yang tertera di dokumen ini bertanggung jawab terhadap permasalahan etik dalam pelaksanaan penelitian ini. Jika anda memiliki permasalahan atau pertanyaan terkait pelaksanaan penelitian ini dengan seseorang selain peneliti, silahkan kontak Dr. Brian Finch, Direktur (etika penelitian), email humanethics@massey.ac.nz”

Appendix C

1. Participants consent form (English version)

Participant Consent Form

Project Title

“Apa saja yang mempengaruhi manajemen ternak sapi dalam pengembangan ternak sapi konteks pengembangan masyarakat perdesaan yang berbasis pasar? Studi kasus di Kabupaten Dompu, Nusa Tenggara Barat, Indonesia.”

This consent will be held for a period of five (5) years.

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree to the interview being sound recorded. (if applicable include this statement)

I agree/do not agree to the interview being image recorded. (if applicable include this statement)

I agree to participate in this study under the conditions set out in the Information Sheet.

Signature: Date:

Full Name – printed:

2. Participants consent form (Indonesian version)

Lembar persetujuan partisipan

Judul penelitian:

“Apa saja yang mempengaruhi manajemen ternak sapi dalam pengembangan ternak sapi konteks pengembangan masyarakat perdesaan yang berbasis pasar? Studi kasus di Kabupaten D0mpu, Nusa Tenggara Barat, Indonesia.”

Lembar persetujuan ini akan disimpan selama maksimal 5 (lima) tahun.

Saya telah membaca lembar informasi dan telah mendapatkan penjelasan detail mengenai studi ini. Saya telah mendapatkan jawaban yang memuaskan atas pertanyaan saya terkait penelitian ini. Saya juga telah mengetahui bahwa saya boleh bertanya lebih lanjut kapanpun selama proses pengumpulan data berlangsung.

- Saya setuju/tidak setuju untuk merekam suara selama proses wawancara
- Saya setuju/tidak setuju untuk mengambil gambar dalam proses wawancara ini
- Saya setuju/tidak setuju untuk berpartisipasi dalam penelitian ini sesuai kondisi yang digambarkan dalam lembar informasi.

Tanda tangan: Tanggal:

.....

Nama lengkap dan tanda tangan:

3. Research assistant confidentiality agreement (English form)

Confidentiality agreement

I, agree to keep confidential all information concerning the project: “What shapes smallholder farmers’ management of cattle in NTB Indonesia and why?” I will not retain, copy, or share any information involving the project as well as the identity of the participants.

Signature:

Date:

Full Name – printed:

4. Research assistant confidentiality agreement (Indonesian version)

Lembar persetujuan asisten peneliti

Saya,, bersedia untuk menjaga kerahasiaan dari informasi yang terkait dengan penelitian yang berjudul: “Apa saja yang mempengaruhi manajemen ternak sapi dalam pengembangan ternak sapi konteks pengembangan masyarakat perdesaan yang berbasis pasar? Studi kasus di Kabupaten Dompu, Nusa Tenggara Barat, Indonesia.” Saya tidak akan mengambil dan/atau menyebarluaskan informasi apapun termasuk identitas dari partisipan dalam penelitian ini.

Tandatangan:

Tanggal:

5. Confidentiality agreement of the researcher

I, Baiq YULFIA Elsadewi Yanuartati, agree to keep confidential all information concerning the project: “What shapes smallholder farmers’ management of cattle in NTB Indonesia and why?” I will not retain, copy, or share any information involving the project as well as the identity of the participants

Signature:

Date:

Full Name – printed:

Appendix D

1. Characteristics of farmland and number of cattle of participants in the Transmigratory case

No	Assets and activities	MHH (13)													WHH (4)				total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	MHH/WHH/other	Mhh ¹	Mhh ²	Mhh	Mhh	Mhh ²	Mhh	Mhh	Mhh ²	Mhh	Mhh	Mhh	Mhh	Mhh	Whh ²	Whh	Whh ³	Whh	17 Hhs
2	Own rain-fed land and used it by themselves. Size		1.25 Ha	4.5 Ha	3 Ha	1.5 Ha	1 Ha	75 are		Y. NA	Y. NA	2 Ha	4 Ha			75 are			12
3	Lease-in rain-fed land. size									0.5 Ha								75 are	2
4	<i>Own rain-fed land but it is used by others through garap or leasing it out.</i> size			2.5 Ha	1 Ha	2.5 Ha			Y.NA									35 are	5
6	Own garden and used it by themselves to grow rain-fed crops (e.g. rice). Size			10 are	20 are	25 are						20 are	15 are						5
7	Lease-in garden to grow rain-fed crops (e.g. rice). size																	25 are	1
8	Keeping cattle in the village the whole year. Yes/No	Y	Y	Y	Y		Y	Y		Y	Y	Y	Y		Y	Y	Y	Y	14

9	own cattle. Number	1	1 (used to have many cattle)	4	3	0 (used to have some cattle)	3	1		1	15	4	5		1	1	1	2	14
10	Kadas. Number			1	1			2		3						1	1	2	5
11	Grow food crops. Yes/No		Y	Y	Y	Y	Y	Y		Y	Y	Y	Y			Y		Y	1
12	Do crop farm labour. Yes/No	Y		Y	Y			Y		Y					Y	Y	Y	Y	9
13	Do off-farm activities. Yes/No	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y		Y		14

Mhh= Men-headed household

Whh= Women-headed households

1= the HH shared house with children's HH

2= the HH shared house with parents' HH

3= a woman acted as the head of a household

Y = yes

NA = Not applicable

1 are = 100 m²

Ha = hectare

2. Characteristics of farmland and number of cattle of participants in the Local case

No	Assets and activities	MHH (15)															WHH (4)				Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1	MHH/WHH/other	Mhh	Mhh	Mhh	Mhh	Mhh	Mhh	Mhh , Son	Mhh	Mhh	Mhh	Mhh	Mhh	Mhh	Mhh	Mhh	Wh h	Wh h	Wh h	Wh h	19 Hhs
2	Own rain-fed land and used it by themselves. Size	4 Ha	2.5 Ha				1.75 Ha		20 are	2 Ha	1 Ha		2 Ha	1 Ha							8
3	Lease-in rain-fed land. Size													1 Ha							1
4	Own rain-fed land but it is used by others through <i>garap</i> or leasing it out. Size			Y. NA																	1
5	Own wet/irrigated land and used it by themselves. Size											0.5 Ha			30 are		70 are		0.5 Ha	47 are	5
6	Lease-in wet/irrigated land. Size							25 are								1 Ha					2
7	<i>Garap</i> wet/irrigated land. Size					30 are															1
8	Own wet/irrigated land but it is used by others through <i>garap</i> or leasing it out. Size																			35 are	1

9	Accessing the main grazing land for cattle the whole year			Y							Y										2	
10	Accessing the main grazing land for cattle during the crop growing season only	Y				Y			Y		Y				Y							5
11	Keeping cattle in the village the whole year		Y		Y			Y		Y			Y	Y				Y				7
12	own cattle. Number	16	8	10	3	2		4	8	4	1	14	3	1	3			2				14
13	<i>Kadas. Number</i>	18			5																	2
14	Grow food crops	Y	Y			Y		Y	Y	Y	Y	Y	Y	Y	Y		Y		Y	Y		14
15	Do crop farm labour		Y		Y	Y				Y	Y			Y	Y		Y		Y			9
16	Do off-farm activities		Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y		15

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