

Anamolbiu- the precious seed

UNDERSTANDING INTERNAL AND EXTERNAL FACTORS THAT
CONTRIBUTE TO THE SUCCESS OF A SEED ENTERPRISE IN A
DEVELOPING COUNTRY



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Abstract

Seed is a basic agricultural input, necessary for the cultivation of food crops and thereby necessary to contribute to food and nutritional security within the population. Access to seed of improved varieties (especially for smallholders in marginalized areas) however is by far not implicit in many countries of the world. The reason here for lies in the deficiency of many national seed sectors. Various donor-funded projects with the aim of establishing seed producer groups or as seed enterprises to create access to seed have failed to be sustainable after withdrawal of the funding agencies. Integrated Seed Sector Development is one strategy to tackle the development of more functional seed sectors, by involving actors (e.g. policy makers, processors, producers, retailers etc.) from both the formal and the informal seed system. Setting up national seed enterprises which utilize local crop varieties, knowledge and labor appears to be a promising concept to not only create access to seed but also conserve agrobiodiversity and traditional knowledge. This thesis presents the case of a young Nepalese seed enterprise which actively involves farmers in breeding and variety selection and produces certified and truthfully labelled seed of Nepalese cereal¹, vegetable and legume varieties. Unlike many others this company manages to sustain itself independently on the market. The main factor facilitating this is the availability of resources on the consumer side in form of remittances from abroad, which takes away a basic hindrance to purchasing a good. A prevalence of agricultural de-skilling among the seed purchasers led to a situation in which the customer had to rely on the advice of a person from his or her social network: a neighbor or the frequently visited retailer. This retailer again stands in personal relation with the company which influences the advice he gives his customers. The company finds itself embedded in a system of social relations that work to its favor as well as in a policy environment which aims on strengthening the private seed sector.

¹ 'Cereal seed' refers to seed of rice, wheat and maize varieties

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Abbreviations

BoD: Board of Directors

CBSP: Community Based Seed Production

CEO: Chief Executive Officer

COB: Community Oriented Breeding

CSB: Community Seed Bank

CSR: Corporate Social Responsibility

OPV: Open Pollinated Varieties

DADS: District Agricultural Development Service

DADO: District Agricultural Development Office

DFID: Department for International Development

DISSPRO: District Seed Sufficiency Program

DoA: Department of Agriculture

FORWARD: Forum for Rural Welfare and Agricultural Reform for Development

GO: Governmental Organization

LI- BIRD: Local Initiatives for Biodiversity, Research and Development

MoAD: Ministry of Agricultural Development

NARC: National Agricultural Research Council

NGO: Non-Governmental Organization

NSC: National Seed Company

PMS: Program planning/formulation and Monitoring Sub- committee

PPB: Participatory Breeding

PVS: Participatory Variety Selection

QSDMS: Quality Standards Determination and Management Sub-committee

RIU: Research-Into-Use

SAKs: Sustainable Agriculture Kits

SEAN: Seed Entrepreneurs Association

SQCC: Seed Quality Control Center

SSSC: SEAN Seed Service Centre

VARRS: Variety Approval, Release and Registration Sub-committee

VDC: Village Development Committee

Important Definitions

<i>Crop Variety:</i>	A crop variety describes a group of plants from the same species, which share certain traits and distinguish themselves therein from other groups of plants from within that species (Almekinders and Louwaars, 1999).
<i>Hybrid Variety:</i>	A hybrid variety is developed from two different cultivars under human influence in controlled circumstances. Usually, and commonly understood as the crossing of genetically uniform parents.
<i>Open Pollinated Variety:</i>	Seed of an Open Pollinated Variety (OPV) is the seed that originates from a plant of an improved or local variety which had been pollination in an uncontrolled way, so by wind, insects, humans, birds or other natural processes.
<i>Local Variety:</i>	A local variety can be defined as <i>"a breed that has largely developed through adaptation to the natural environment and traditional production system in which it has been raised"</i> (FAO, 2013).
<i>Truthfully labelled seed:</i>	Seed with information kept on the label, e.g. producers' name, crop, variety, year of production, germination percentage, purity percentage, lot number etc.

CHAPTER 1- INTRODUCTION

1.1 Seed Systems and Seed Sector Development

The process of acquiring seed is pivotal in farming- without seed, no plant, without plant no harvest. Sourcing seed happens in different ways and through different sets of channels, which were defined as being mainly two different systems: the formal and the informal seed system (Almekinders, 1994, Gill, 2013). Formal seed systems are referred to as chains of official institutions involving research institutions, private seed companies and governmental seed companies with access to and control over technology and financial resources that develop and deal with certified seed (Almekinders et al., 1994). The improved seed originating from the formal sector does not reach all farmers, especially those who live in marginalized rural areas of developing countries. In the realm of private commercial companies, *'ten companies now control more than two thirds of global proprietary seed sales'* (etc group, 2008, p.3). Among these ten companies, the leading three, Monsanto (US), DuPont (US) and Syngenta (Switzerland) cover 47% of the world's commercial seed market (etc group, 2008). These large scale multinational companies put their production focus on genetically engineered seeds, meaning the direct manipulation of a plant's genetic information (the genome) using biotechnology.

Informal seed systems of small scale farmers with limited access to many resources on the other hand do account for *'the seed for 75%- 90% of all food crops cultivated'* (Almekinders et al., 1994, Sperling and Mc Guire, 2010 in Gill, 2013, p.141). Apart from that they often represent a critical source for biodiversity and neglected and underutilized varieties and in many cases provide the only source for nutrients to the farming communities. Thereby they also contribute to the resilience of marginalized communities in relation to for example natural disasters or political unrest (Gill et al., 2013): Farmers sourcing seed from a (reliable) informal supply system are less dependent on external factors such as for example at all times functional infrastructure. In many cases however, farmers do make use of both the formal and the informal system. This is the case because one of the systems might be more suitable for a certain crop under certain conditions (Sperling and Cooper, 2003).

In Nepal both, formal and informal seed supply systems are operating. The formal sector, which can be pictured as an interlinked chain of official bodies (Rana et al., 2011) features three important institutions: the Department of Agriculture (DoA), National Seed Company Ltd. (NSC) and the Nepal Agricultural Research Council (NARC) on the public side and several private companies on the private side. Farmers in remote areas do not have access to these sources simply due to spatial distance and private companies focus their enterprise on areas where higher profit can be attained (Shrestha and Wulff, 2007). In Nepal this means in cities and larger towns and their peripheries. The biggest share of the rural areas are mountainous and often hard to reach other than by foot. Consequently, many farmers make use of informal seed supply systems. This means they engage in acquisition practices like farmer-to-farmer exchanges (either for other seed, grain or money), barter trade or on-farm saving practices (Almekinders and Louwaars, 1999; Rana et al., 2011; Cromwell, 1996). It has been observed that farmers have many reasons to prefer informal seed supply systems. So does for example seed sourced from a neighbor or relative not carry so much risk for a farmer, as (s)he feels, (s)he knows about quality, performance and variety (Almekinders and Louwaars, 1999). Work on commercial seed sector development suggests that a commercial seed supply system actor only has

chances to succeed when offering the farmer better quality seed than he or she could source informally (Tripp, 2003). The informal seed system is the one saturating as much as 90% of Nepal's seed demand (Shrestha and Wulff, 2007). The amount of seed obtained from formal sources is extremely low, which is slowly changing through increasing number of activities from the side of Non-Governmental Organizations (NGOs) and Governmental Organizations (GOs) (Shrestha and Wulff, 2007). A study on rice seed selection and seed supply systems in Nepal also identified the social network of farmers as '*a valuable social resource for the community for provision of seed management in terms of access to genetic materials and associated knowledge*' ((Rana et al., 2011, p. 260) within informal seed systems.

The process of seed sector development aims on establishing a functional national seed sector. Such a seed sector should enable a country to reach a state of being '*seed secure*'. This describes a situation in which quality seed is sustainably available in adequate quantities and readily accessible for farming households (FAO, 2015; Tripp and Louwaars, 1997). A state of seed security would as a logical consequence influence the level of a country's food security. At the World Food Summit (1996) the state of being food secure was defined as follows: '*Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life*'. Many developing countries have not managed to reach the state of being seed secure. This was constituted by the failure of state-owned seed enterprises and the slow growth of commercial seed sector initiatives (Tripp and Rohrbach, 2001). Different approaches have been introduced as a reaction to those failures, with a common one being the formation of farmer groups for seed production (Tripp and Rohrbach, 2001; Bentley et al., 2011; Witcombe et al., 2010). Projects that worked with the approach to organize farmers as seed producers have shown to not develop retail trading networks and therefore failed to reach out to farmers outside the producer communities (Tripp and Rohrbach, 2001).

It appears that in order to create a functional seed sector it is necessary to employ an integrated approach that incorporates public and private actors from different places of the formal as well as from the informal seed sector (Sperling and Cooper, 2003; Louwaars and de Boef, 2012). However there is no generally agreed on definition yet for what is commonly called '*Integrated Seed System*' (McGuire and Sperling, 2013). Louwaars and de Boef (2012) talk about '*creating coherence amongst seed practices, programs and policies*' (Louwaars and de Boef., 2012, p. 41). This concept of interlinking formal and informal seed system actors in complementing way is referred to as Integrated Seed Sector Development (ISSD) and so far implemented, respectively in the preparation phase in five African countries (ISSD, 2015). It describes the attempt to develop national seed systems which integrate public and private actors. Louwaars (2012) further refers to two basic principles of ISSD: (I) the facilitation of interaction between formal and informal seed systems and that (II) seed sector development approaches should include '*public, private, community-based, or NGO stakeholders, each of the assuming specific responsibilities in dissimilar seed value chains*' (Louwaars and de Boef, 2012).

Problem Statement

There is general agreement about the importance to invest into the development of improved crop varieties since they can be beneficial in various aspects. Ideally, crops of improved varieties can have a higher pest and disease resistance and are less affected by draughts and are higher yielding- just to name a few benefits. Access to seed of improved varieties can also be beneficial for marginalized farmers within resource constrained environments. Some improved varieties for example have the potential to generate higher yields independent of the presence of additional inputs such as for example artificial fertilizer (Cromwell et al., 1992). On a societal level a situation in which farmers have access to seed of improved varieties can contribute to an increase of food security and nutritional security within a country. All these benefits can however only be harnessed when farmers also have access to the seeds of improved varieties, which is not the case in many developing countries (Cromwell et al., 1992). Different strategies to facilitate the availability and access of seed of improved varieties were explored over the recent years but hardly produced positive results (Bentley et al., 2011; Witcombe et al., 2010).

In the realm of seed sector development a range of different approaches has been applied which aim on improving farmers' access to seed of improved varieties. In many African countries for example, the 'usual' way of distributing bean seed is through NGOs and GOs as part of developmental programs (Rubyogo et al., 2010). In many places in Africa it is a common approach to try and organize farmers for seed production either in groups or as individuals (Bentley et al., 2011). Also in Nepal the approach of forming sustainable seed producer groups has repeatedly failed after the donors withdrew from the projects (Witcombe et al., 2010). Those recurrently reported failures led Bentley et al (2011) to the conclusion that private seed companies might be the more viable alternative to approach sustainable seed sector development. Literature however suggests that this is only possible *'when they [seed enterprises] can offer farmers a clear advantage over seed saving'* (Tripp, 2003, p.1). Central matters that determine the use of seed by farmers are availability, quantity, quality and price (Louwaars et al., 2012), so these are as well the points in which a seed enterprise should be holding advantages for the farmers. There is however little evidence available of successful, commercially sustainable seed enterprises that evolved from farmer groups which were organized for seed production as part of development projects of NGOs or GOs (Bentley et al., 2011; Tripp, 2001). Within these initiatives, source seed and further agricultural input provision as well as marketing activities were in the hands of the NGO/GO, leaving the farmers with seed multiplication as their only responsibility. Also other problems were encountered. In some cases it is difficult to keep the supply of seed on a high level, for example when there is no demand from the farmers. Reasons for low demand may be of different nature such as low crop productivity and a resulting lack of financial resources of farmers, unavailable output markets/ no proper linkages to them (MacRobert, 2008), varieties of which seed is sold not being adapted, or simply not perceiving a seed enterprise to be a trustworthy source of seed. Other reasons for failure of seed enterprises are inadequate planning and organization in terms of a structured business plan and market analysis before starting to operate and the access to human and financial resources (Bishaw and van Gastel, 2008). All this makes it hard for a seed enterprise to sustainably remain on the market.

Informal seed systems are prevalent in farming communities all over the world (Gill et al., 2013, Seboka and Deressa, 1999; Badstue et al., 2006). Within those communities, seed is circulated

between various individuals which adds a social component to informal seed supply systems. Mc Guire (2008) for example describes seed systems as social systems in which important practices such as the actual seed exchange are affected by social norms and relationships. A study conducted on collective action in an informal seed system by Badstue et al. (2006) in Mexico showed that farmers without any formal organization to mediate seed transactions rely on existing informal institutions (social networks) to access seeds. A study on rice seed selection and supply systems in Nepal also identified the social network of farmers as *'a valuable social resource for the community for provision of seed management in terms of access to genetic materials and associated knowledge'* (Rana et al., 2011, p. 260). These are aspects, that are of importance to farmers and play a role in some cases (consciously or subconsciously) influencing the decision where to source seed from. It might as well be difficult to reach farmers who live in marginalized rural areas and can therefore not easily reach a store, market or other place where seed is sold. Many actors and their relations with each other play a role as factors that may influence the success or failure of a seed enterprise. This entire network of actors and relations can be perceived as a system in which the different elements are related and linked by inter-human social relations and arrangements.

The case of Anamolbiu Pvt. Ltd. features a company that has control over its own, to large parts vertically integrated, supply chain and tries and combines formal and informal seed systems and their actors along this chain. It includes farmers in its' breeding and variety selection processes and employs them as contract growers. It further puts focus on Corporate Social Responsibility (CSR) and equal distribution of benefits along the supply chain. The company Anamolbiu Pvt. Ltd. developed out of a project of the Nepalese NGO LI- BIRD (Local Initiatives for Biodiversity, Research and Development) but is operating independently since 2010. By exploring the set-up and social environment of Anamolbiu Pvt. Ltd. I aim to gain a better understanding of the circumstances that influence success or failure of a seed enterprise in a developing country. Thereby this case study could contribute to broaden the basis for future research and interventions in the line of seed sector development.

Research Objective and Research Questions

Research Objective

This study aims to contribute to understanding how a seed enterprise in a developing country can be able to independently sustain itself on market through the selling of seeds.

Main Research Question

<<What characteristics in the set up and the social environment enhance the opportunities of a small-scale national seed enterprise in a developing country to sustain itself through seed purchasing farmers? >>

Sub Research Questions

Consequently, the sub questions that were formed to organize this research are leaned against the above mentioned objectives:

- 1) *How is Anamolbiu Pvt. Ltd. organized, what is its' mission and who are the actors it relates to?*
- 2) *Who are the farmers that source seed from Anamolbiu Pvt. Ltd. and what is their motivation to do so?*
- 3) *Is there a specific relation between how Anamolbiu Pvt. Ltd. is organized and the demand for their seeds by farmers?*

1.2. Methodology and limitations

Research Design

This research was designed in form of a three months case study in order to explore what conditions are that create possibilities for a national seed enterprise to sustain itself on the market. The basis for this case study is Anamolbiu Pvt. Ltd., a Nepalese seed company and its breeders, contract growers and customers. Before going to the field I prepared myself by means of extensive desk research, making use of scientific journals, books and the website of the company. After arriving in Nepal I arranged a translator for each main research site. I interviewed three types of farmers: (1) contract growers, (2) Participants of the Client Oriented Breeding (COB) program and (3) Agro-Vet² customers. I also interviewed Agro-Vet store owners and shopkeepers, (ex-) staff members of Anamolbiu Pvt. Ltd., the president of the Seed Entrepreneurs Association Nepal (SEAN) and the marketing manager of a public seed company. The two latter ones were interviewed in order to gain more thorough background knowledge on seed in Nepal. As far as possible the interviewees from the groups contract growers and COB participants were chosen to equal shares from younger and elderly persons and both female and male farmers. The interviewed Agro-Vet customers were chosen randomly at the location. I tried however to maintain a balance between genders and different generations.

Locations and Interviews

² Agro-Vet is the term use for agricultural supply store in Nepal, originating from the words agriculturalist and veterinarian.

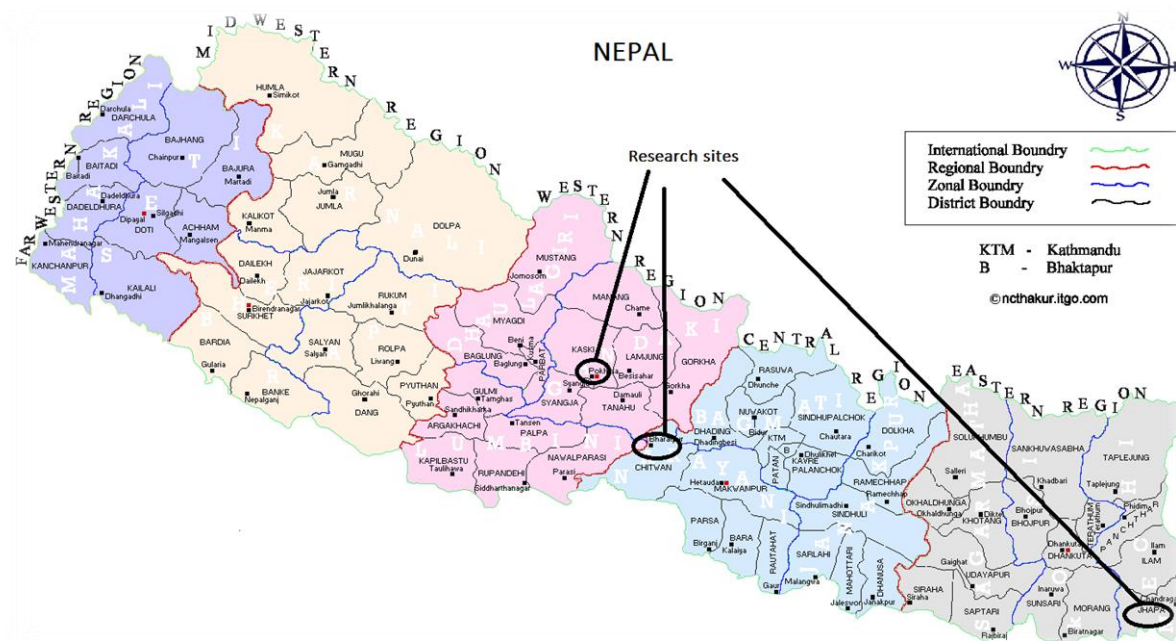


Figure 1: Map of Nepal, Research sites indicated (adapted from HMG Survey Department, National Geographic Information Infrastructure Project (NGIIP))

I mainly worked in two different regions: Chitwan and its adjoining district Nawalparasi and Jhapa (see Figure 1). To gain understanding on why farmers make the decision to work for/ with Anamolbiu Pvt. Ltd. and how they perceive this interaction, I visited ten different farming households in each region. All farmers were interviewed at home. This was done to spare the interviewees transportation costs and time to get to a different interview location, observe possible interactions between community members and to roughly estimate their economic status and get an impression of the living conditions. Uttam Raj Adhikari, the marketing manager of Anamolbiu Pvt. Ltd. selected ten farmers living in four different locations according to availability of the farmers, reachability by public transport and walking and my conditions on age and gender diversity. Eight of those ten farmers were individually linked with the company. In Nawalparasi, I interviewed two contract growers who are part of a farmers group for seed production and among the ten farmers selected by Anamolbiu Pvt. Ltd.. This farmers group has its' meeting point in Arun Khola a town which provides shopping possibilities for the people from surrounding villages and is located at the Mahendra Highway which passes Nepal from East to West and is the major highway of the country. This meeting point is a multipurpose shop run by the president of the group. It also serves as distribution and collection center for the seed produced by the farmers and was chosen as interview location due to its central position. Also in Jhapa ten farmers were selected by the Anamolbiu Pvt. Ltd. site officer Mahendra Chaudary according to their availability, reachability by public transport and walking and their willingness to be interviewed. The company's office is located in the city Surunga, the trade center of Jhapa district. The selected farmers were located at three different places which is why I took three rounds of interviews. The first round of interviews was conducted at a village close to the town Durgapur. Alike Arun Khola also Durgapur is situated along the Mahendra Highway, which is frequently travelled on by public transport, private cars, scooters and motorbikes. From the bus stops that are scattered along the highway unpaved roads lead into the paddy fields and towards the farmers' households. The next two rounds of interviews were taken at two different places just

outside Surunga. Also here, I visited the households of the interviewees for the same reasons as in the case of the contract farmers.

The majority of observation of retailers and customers as well as semi-structured interviews with both of those parties were undertaken at five different Agro-Vet stores in Narayangarh, Chitwan. This was done to understand the seed sourcing behavior (demand, preferences in varieties/ companies, purchasing frequency) of farmers and the role the retailer plays in it. At the same places I conducted semi-structured interviews with customers, again to understand their seed sourcing behavior (demand, preferences in varieties/ companies, purchasing frequency) but also to be able to understand the reasoning behind purchasing decisions. The remaining interviews and observations were taken in one Agro-Vet store located in Parsa, a small town approximately 20 kilometers from Narayangarh. The Agro-Vet stores were randomly chosen from a list with all eight Agro-Vet stores Anamolbiu Pvt. Ltd. supplies within the city of Narayanghar. This list was made available by Uttam Raj Adhikari of Anamolbiu Pvt. Ltd.. The one store in Parsa was chosen to get an indication whether there is a difference in selling and purchasing seed in a bigger city and a small town. All customers that entered the stores were asked whether they were farmers and whether they could spare a few minutes for an interview. After 15 interviews were taken I started to pay more attention to gender and age in order to attain a more or less balanced interview population. In each Agro-Vet I spent at least one day observing the daily procedures and retailer- customer as well as customer- customer interactions while also engaging in casual conversations with retailers and customers.

The Anamolbiu Pvt. Ltd. staff was interviewed in their respective offices. In order to gain a thorough understanding of the built- up, philosophy and operations of Anamolbiu Pvt. Ltd., I interviewed the CEO, the present and the former marketing manager, the finance and accounting manager, the production officer of the company of the headquarter in Chitwan and the site manager of the branch office in Jhapa. The only site of Anamolbiu Pvt. Ltd., which is operated without farmer participation is the research and production site for hybrid seed of different tomato varieties. I visited the site, which is located near the village Mauja in Kaski district and observed the working process at site in order to get a complementary understanding of the company's activities.

In an attempt to gain more thorough knowledge about the formal seed system landscape of Nepal I interviewed the research and development manager of the SEAN Seed Service Centre Ltd., a public seed company related to the Seed Entrepreneurs Association Nepal (SEAN). I went to his office at the company's headquarter which is located in Kathmandu. Here I was also able to visit the different departments of the company and to get an insight in their working processes.

I also interviewed the president of SEAN to gain better understanding of the processes within the Nepalese formal seed supply system in general. After making an appointment with him via phone I visited him in his office in Narayangarh, Chitwan. Both these connections have been established through a contact person who works as freelance consultant for agriculture and enterprise development.

The data collection for this thesis included two main methods: semi-structured interviews and participatory observation in five different districts of Nepal.

Data Processing

The processing of field data was partly carried out parallel to conducting interviews and observing. I kept a journal for field notes in which I put my observations on record. All conducted interviews were documented with help of a voice recorder and subsequently transcribed. During the writing process I went back to my transcripts when necessary. The data derived from the structured interviews was entered in EXCEL and processed into pie charts.

Table 1: Summary of interviewing and observation scheme for all locations

WHO?	WHAT?	HOW MANY?	WHERE?
Anamolbiu Pvt. Ltd. (ex-) staff	Semi- structured Interviews	6	Chitwan
Other formal seed system actors	Semi- structured Interviews	2	Chitwan Kathmandu
Contract growers	Semi- structured Interviews	10	Chitwan
COB participants	Semi- structured Interviews	10	Jhapa
Agro- vets	Semi- structured Interviews	5	Chitwan
Buyers	Structured Interviews	27	Chitwan
Agro- vets and Buyers	Observation		Chitwan

Permanent and temporary Anamolbiu Pvt. Ltd. staff and LI-BIRD staff	Observation	Kaski
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Limitations

The main limitation I encountered was the language barrier. Due to my insufficient knowledge of the Nepalese language and the difficulties of the Anamolbiu Pvt. Ltd. staff to communicate in English it was hard to understand each other. The Anamolbiu Pvt. Ltd. staff was in the position of being the gatekeeper to the farmers I wanted to interview. Also is little internal information of the company's operations such as for example financial record or yearly reports available in written form or only written in Nepalese script. Getting access to this information via interviews proved difficult due to the language barrier. My translators all had an undergraduate degree in agronomy, but were not trained as professional translators. This implied occasional difficulties translating at some points. During the interviews at the Agro-Vet stores it sometimes proved difficult to finish an interview entirely or to go as much in depth as planned. The reason for that lies in the nature of the interview location: farmers are coming there with the concrete aim to buy something or to get advice on something. Asking their time for an interview can easily be perceived as interruption and lead to less willingness to cooperate.

1.3. Conceptual framework

System thinking

System thinking is an approach that helps to encompass or set apart a certain part of reality that one wants to further examine. Thus, it can be seen as an approach to structure reality in order to be able to analyze it. Generally spoken a system can be understood as an accumulation of elements with particular characteristics which together form a cohesive whole (Ten Haaf et al., 2002). The elements within a system are connected and influence each other, in other words, they stand in a flexible relation to each other. From this point of view, the entire world and all processes and individuals so, briefly put, everything is part of one big system. Since that is a way too complex and wide frame to observe or examine something it is necessary to identify a part of the large, overarching whole and set it apart. This part can then again be seen as an independent and is defined by a system boundary which is set by the researcher (Ten Haaf et al., 2002). Ten Haaf et al. (2002, p. 55) describe the feature of flexibility of a system as follows : *' If the characteristics of one element change, and a relationship between different elements exists, then consequently also the characteristics of the other, connected or related elements change'.*

Within a system various sub systems can be found. A sub system can be understood as a system which is (as an entity) element of another, bigger system. According to Ten Haaf et al (2002) additionally to sub systems also aspect systems can be identified. Aspect systems are defined

according to the relations within the subsystems and can for example be of economic, social or natural nature.

For this thesis, I defined Anamolbiu Pvt. Ltd. and all actors that are directly involved with it as the system to be researched. Within the case of Anamolbiu Pvt. Ltd. I defined three subsystems: the supply system of the company and the formal and informal seed systems and their actors.

As already touched upon, looking at a situation or scientific problem from a system thinking perspective basically means finding a way to discern and represent a certain part of reality and thereby make it more understandable. This is what also happened when the terms formal seed supply system and informal seed supply system came into existence. The term informal seed supply system describes all the seed acquiring and managing processes occurring outside those official institutions and within farming communities. Those could be for example farmer-to-farmer exchanges, barter trade or on-farm saving practices (Almekinders and Louwaars 1999; Rana et al., 2011; Cromwell, 1996). Here the elements of the system are the farmers. They are connected through social relations and arrangements. The way I refer to social arrangements is derived from the work of James Scott on the moral economy of the peasant (1977). He mentions *'patterns of reciprocity, forced generosity, communal land and work-sharing'* (Scott, 1977) which are utilized within farmer societies in order to manage the available resources and avoid the family's starving. Formal seed supply systems are referred to as chains of official institutions such as *'research institutions (breeding varieties), government seed companies or parastatals, and private commercial companies dealing with clearly defined products: certified seed of verified varieties'* (Louwaars, 1994 in Rana et al, 2011, p. 259). Here the various actors are the elements of the system and connected through trade-, monitoring-, social-, or supply relations. Another element and sub system that is important in my research is the supply system. The company I am looking at owns and controls large parts of its' supply chain. In simple terms, a *'supply chain includes all links from the point of production to the end-user or final consumer. The supply chain therefore contains a sub-set of markets or marketing systems'* (FAO, 2015). This means a supply chain basically encompasses a series of activities as well a flow of information and money and the steps a product has to run through from the producer to the consumer. Supply chain actors can be producers, processors, transporters, wholesalers, retailers, service organizations and consumers. Since a system can be defined as *"a whole composed of elements that are related to each other"* (Ten Haaf et al., 2002, p.53.), a supply chain can also be perceived as a supply system. The above mentioned actors then are the different elements of the supply system. They relate to each other by performing activities which are necessary pre-conditions for the other actors to function properly: they influence each other just like the various elements of a system do. Within this supply system, again subsystems are found that build an entire functional system in themselves as part of the overarching system Anamolbui Pvt. Ltd. The farmer communities from which contract growers that work with the company originate are in itself a system, a social network with individuals connected through social arrangements. Ten Haaf et al. (2002) also talk about open systems. An open system is a system which is influence by selected actors that are positioned outside the system boundary but nevertheless important to the system.

Altogether, the case of Anamolbiu Pvt. Ltd. is quite complex as it involves many different actors (sub systems) with subtle relations between them. The processes within these sub systems, the relations that connect the inherent elements influence the setup of the respective sub system. The members of a farming community for example are connected through social arrangements that follow specific rules. If one farmer changes his or her behavior towards the other community members or just uses these social arrangements in a modified way this small change will have consequences for other members of the community as well. Next to the farming communities there are other sub systems in

place such as the previously mentioned supply system and the informal and the formal seed system. These sub systems are partly overlapping in terms of elements. This is where the idea of aspect systems come to play. The aspect system that I make use of is the one of social relations (social arrangements) which are at play within all identified sub systems. There are other aspect systems at place as well which I do not consider relevant for my research.

Social cohesion and agricultural de-skilling

The concept of social cohesion is a phenomenon looked at by many scholars over the past decades. In a review of literature on social cohesion, Friedkin (2004) finds that there is no universally agreed on definition of social cohesion. Often however definitions include notions of solidarity, belonging together and relying on each other (Demireva, 2011). Chan et al. (2006, p.290) made an attempt to define, which is closest to the initial meaning of the word 'cohesion'. I chose this definition as it best fits the purpose of my study. *'Social cohesion is a state of affairs concerning both the vertical and the horizontal interactions among members of society as characterized by a set of attitudes and norms that includes trust, a sense of belonging and the willingness to participate and help, as well as their behavioral manifestations'* (Chan et al., 2006, p. 290). Vertical interactions refer to the interactions between state and society and horizontal interactions to those taking place between different individuals and groups within the society (Chan et al., 2006). In the particular case of this study, attention lies on the social cohesion within the informal seed system. As mentioned previously the informal seed system is composed of different elements (the farmers) and their (social) relations to each other. Special attention is paid to what Chan et al. (2006, p.290) name *'a set of attitudes and norms that includes trust, a sense of belonging and the willingness to participate and help'*, which are part of and do influence the social relations within communities. These social arrangements that constitute social cohesion relate the farmers to each other. I decided to put a bit more emphasize on trust as element of social cohesion since I consider it fundamental in the context of my study. Trust (and distrust) is a notion that is prevalent in settings where individuals or groups interact with each other. Therefore it plays a role not only in the interactions within the communities, but also between farmers that work with/ for a seed enterprise and the enterprise (both ways) and between farmers and retailer. Trust is a concept used by psychologists, social scientists and economists and is viewed from respectively different angles. Still there is some basic characteristic of trust which is captured in the following overarching definition by Rousseau et al. (1998): *"Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another"* (Rousseau et al., 1998). This definition implies that trust is always connected to taking risks. But once established it can serve as a basis, an enabling factor catalyzing actions. One way of looking at trust is as interaction-based trust. Bachmann (2001) states that this trust *'develops on the basis of personal face-to-face experience between two (or more) individuals'* (Bachmann, 2001). This form of trust is the one I expect to be prevalent within the farming communities that are involved with Anamolbiu Pvt. Ltd. since they closely live together and are interacting with each other in a regular basis over a long period of time, in some cases over generations.

The concept of social cohesion structurally relates with the one of social networks. These two theoretical standpoints complement each other in a way suitable for addressing the different facets of this research project. A social cohesion perspective together with social network thinking provides

a way to better understand motivations of farmers to make use or not make use of the formal seed system as well as exploring and explaining the possible consequences for and/or utilization of the social relations related to seed acquisition. Social networks are found all over the world where individuals interact with each other over a longer period in time. Granovetter (2005) introduces the idea that social networks can differ in density. The denser a network is, thus the closer the inter-human relations are, the more cohesive the ideas, principles and information is that gets passed on between different individuals. Granovetter (2005) also talks about '*structural holes*' in dense networks. He refers to individuals who are part of a dense social network but nevertheless have an interest to gather information from external sources. Through this, they make it possible for new information to enter and diffuse in their own social network. This set up might have implications on the way and frequency that new information enters the social network, thus on learning processes within a community.

Stone (2004) wrote about the process of skilling being a mixture of both, social learning and environmental learning. Bandura and McClelland (1977) describes social learning as a cognitive process that occurs through observation or interaction in a social context. Henrich and Gil-White (2001) identified two components within social learning: the prestige bias and the conformist bias. The latter one describes a situation in which a person adopts something if or because others do it, while the first bias refers to situations in which something (e.g. a livelihood strategy or a farming practice) is adopted because an individual with for example a high social status is doing so. Environmental or individual learning describes a more reflective way of learning. It is a learning process in which the individual consciously evaluates different options and for example compares the usefulness of different practices before adopting one (Stone, 2007). When applying Granovetter's (2005) concept of structural holes in dense social networks, one could say that the learning process that happens within a dense network is social learning. Whereas the individuals who constitute the structural holes are individuals who go through a process of environmental learning. They do for example acquire new information on agricultural production techniques from outside their cohesive, dense network (e.g. their community) through participating in a training program. The knowledge acquired from this training enters their community (their dense social network) and diffuses through social learning.

Being derived from the concept 'skilling', the concept of agricultural de-skilling refers to the disruption of the skilling process. Stone (2007) identified three components in which the difference between industrial and agricultural de-skilling become obvious and help to define the concept.

Agricultural de-skilling is:

- (I) not the displacement of a static set of skills but rather *the disruption of an ongoing process of skilling*.
- (II) *the disruption of the balance between social and environmental learning that is instrumental in farm production*.
- (III) not simply the automation of farm tasks; it is *the degradation of the farmer's ability to perform*

The concept of agricultural de-skilling helps to understand the motivation and reasoning of farmers to make use of formal seed sources and therefore also of improved seed. In a case study on the spread of genetically modified cotton seed in India, Stone (2007) elaborates on the notion of agricultural de-skilling in the context of diffusion and adoption of agricultural innovation.

He argues that agricultural de-skilling is substantially different from industrial de-skilling. Here production processes are so to say taken apart and individuals who do not need to have knowledge about the entire process fulfill certain tasks. Stone (2007) provides the example of a slaughterhouse

worker who is not able to correctly name different parts of an animal but is still able to disjoint it in consumable pieces. A subsistence farmer however still needs to be able to perform every step within the production and processing of his produce.

In the case of Anamolbiu Pvt. Ltd. and all the different actors that are involved in the company's operation it is of use to understand the role that social cohesion plays in the diffusion of knowledge and information in relation to seed use. This can help to explain the motivation of farmers to work with Anamolbiu Pvt. Ltd. as well as the reasoning to purchase seed from them, which might deviate from purely economic reasons.

CHAPTER 2- NEPAL AND THE SEED SECTOR

2.1. Important country characteristics

Geographical position

Nepal is a landlocked, South Asian country in the Himalayas. The elevation ranges from 66 meters to 8 848 meters above sea level (Dong, 2009). The country spreads out around 885 kilometers east-west and 145- 248 kilometers north-south. At its' southern, eastern and western sides it borders with the Republic of India and at its' northern side to the People's Republic China. Nepal is split into five administrative divisions, so called development regions: Eastern Region (Purwanchal), Central Region (Madhyamanchal), Western Region (Pashchimanchal), Mid-Western Region (Madhya Pashchimanchal) and Far-Western Region (Sudur Pashchimanchal). These five regions are again grouped into 14 administrative zones (Nations Online Project, 2014). Further, the country is divided into 75 districts. Each district is again divided into several Village Development Committees (VDC). These are comparable to municipalities. The country is also divided into five different physiographic zones (see Figure 2) with an increasing altitude from south to north. The agricultural production in Nepal differs according to these zones:

1) **Terai** (sub-tropical)

The Terai region is known for its high production of cereal crops, such as rice, maize and wheat. Other typical crops are mustard, sugar cane, jute, tobacco, cotton and tea. Further, oat, barley, potato, buckwheat, yams, amaranths and medicinal herbs are grown here.

2) **Siwaliks** (sub-tropical)

The climate is very dry but modified by regular winter fogs. Crops cultivated here are rice, maize, wheat, millet, radish, potato, ginger, tea, mango, papaya, banana and potato.

3) **Middle Mountains** (sub-tropical in valley bottoms, warm temperate on valley sides , cool temperate on higher ridges with occasional snowfall)

The middle mountains are highly cultivated and more than 60% of Nepal's population lives here. The land which is not used for agricultural production is occupied by dense sub-tropical forest. Cultivated crops are rice, maize, wheat, millet, barley, pulses, sugar cane, ginger, cardamom, mango, papaya, banana, orange, lime, lemon, peach, plum, potato and cauliflower

4) **High Mountains** (alpine with a nival climate above the snowline)

In the high mountains one season of crops a year can be harvested in the valleys. The mountains provide grasses for the grazing of yak and sheep after the snow has melted. Crops

grown here are oat, barley, wheat, potato, buckwheat, yams, amaranths, medicinal herbs chestnut, walnut, apple, peach, plum and apricots.

5) **High Himalaya** (alpine with a nival climate above the snowline)

From June to September, this area is used for grazing. In some parts apple, walnut, vegetable seed, and potato are grown (Kansakar et al., 2004).

The areas in which the research for this case study has been conducted Chitwan, Kaski and Jhapa are located respectively in the Siwaliks, the Middle Mountains and the Terai (see Figure 2). In common language use the Siwaliks are also referred to as Terai.

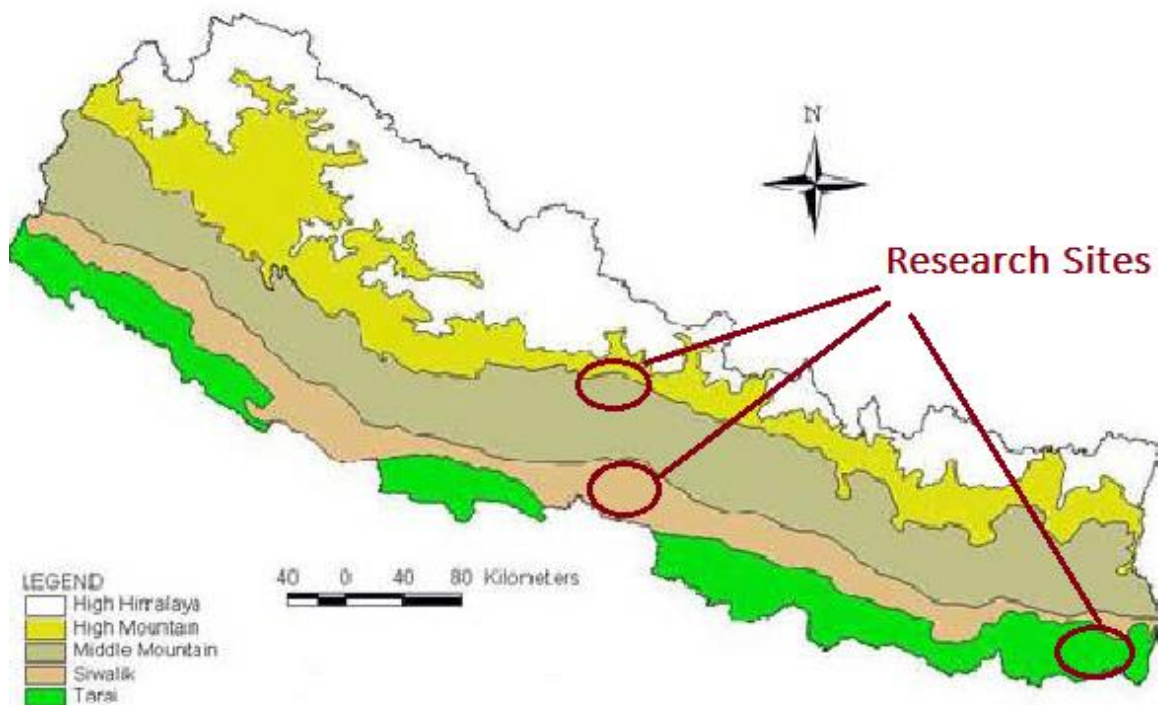


Figure 2: Physiographic regions of Nepal (adapted from Soil Science Division, NARC)

Migration

Migration is an ever present topic in Nepal. In the fiscal year 2013/2014 Nepal issued a total of 521 878 labor permits for foreign employment this equals about eight percent of the country's population. Labor migration increased significantly over the past five years. In 2008/2009 the number of foreign labor permits was only 219 965 (Labor Migration Report 2013/2014). These numbers do not include individuals moving to India for employment. Nepal and India share an open boarder which makes it more difficult to maintain an overview about labor migration to India. Also illegal migrations as well as individuals who leave Nepal for education are not included. According to the

UNESCO Institute of Statistics, there were over 24,000 Nepali students studying overseas in 2010. More than 50 percent of all persons who migrated within the past 5 years originated from the Terai Region of Nepal. The most popular destinations are Malaysia, Saudi Arabia, Qatar, United Arab Emirates and Kuwait. According to the Labor Migration Report 2013/2014, the remittances received from Nepalese persons working abroad constituted 29 percent of the country's Gross Domestic Product in 2014 and have become a main factor in contributing to an increasing household income. It further states that *'the incidence of poverty would jump from 19.3 per cent to 35.3 per cent if remittances stopped'* (Labor Migration Report 2013/2014, p.36). There is indication that also unregistered remittances flow into the country.

2.2. Seed in Nepal

History

The first new varieties of wheat and maize which are the main crops produced in Nepal were introduced in the 1950s and 1960s. In the 1970s, the Food and Agriculture Organization of the United Nations (FAO) supported the establishment of a seed processing unit which was somewhat the beginning of organized seed production and distribution (Country Integrated Seed Sector Status Paper of Nepal, 2012). Nepal's seed sector has largely been constituted by the public sector and international donors until the late 1980s (SQCC, 2014). With the publishing of the *'National Seeds Act'* in 1988 a change has been heralded: the greater involvement of the private industry in variety selection and seed production and distribution (The Seeds Act, 1988). From here on, a development towards a seed sector informed by collaboration between public and private sector started. In 1990, the Nepal Agricultural Research Center (NARC) was established, which was the beginning of a more research oriented seed sector development. This was approached by implementing different strategies such as Participatory Varietal Selection (PVS), Participatory Plant Breeding (PPB) and modern biotechnological approaches. In 1991, the Seed Entrepreneurs' Association of Nepal (SEAN) was founded as an official body that represents and facilitates the interests of private seed sector actors. It builds a platform for entrepreneurs that are engaged in production, processing, marketing and importing of Nepalese seeds (M. R. Diwali, Interview 2014). Also in the 1990s, the National Seed Policy was disbanded. This is a policy paper that encourages and facilitates the strengthening of the private seed sector. Strong emphasize is put on seed production and distribution in the more remote areas such as hilly and mountainous spaces. Currently, the national seed system of Nepal includes four major components: the private sector, public institutions, international collaborators and farmer communities (see Figure 3). The development of this sector is an ongoing process. The strategies employed in this process are stipulated in the National Seed Vision 2013- 2025, composed by National Seed Board (NSB) and the Seed Quality Control Center (SQCC) under the Ministry of Agricultural Development (MoAD). It provides a strategic plan on how to strengthen the Nepalese seed sector. Currently large shares of the market are catered for by imported seed from multinational seed companies (National Seed Vision 2013-2025). With the National Seed Vision, the Nepalese Government aims to provide directives to all parties involved with variety development and maintenance, seed multiplication,

seed processing and conditioning, marketing and quality control. It also sets guidelines for the upcoming ten years in order to *'increase crop productivity, raise income and generate employment through self-sufficiency, import substitution and export promotion of quality seeds'* (National Seed Vision 2013- 2025, p. 8).

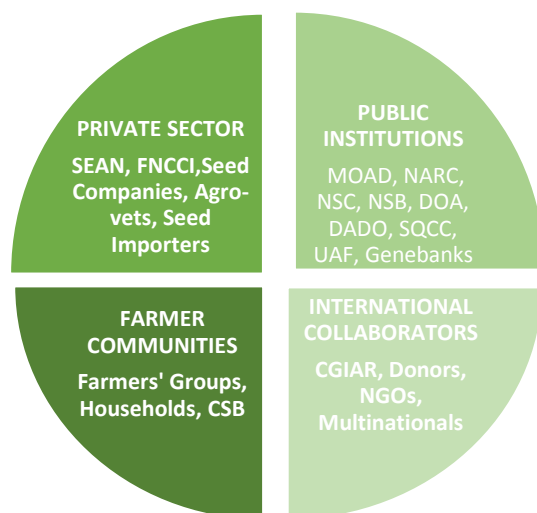


Figure 3: The four components of the Nepalese Seed Sector (adapted from R.P. Sah, 2014)

The formal seed system in Nepal

Public institutions

The MoAD constitutes the head of the public institutions that play a role in Nepal's seed sector. It has the Ministry of Agriculture and Cooperatives under it which again together with the National Seed Board (NSB), operates one level superior to the SQCC. The SQCC is an independent quality control organization and is responsible for seed testing, maintaining testing standards, registration and updating of varieties of imported/exported seeds and monitoring and inspection to control seed quality (IFPRI, 2011). A new crop variety can only be released to the market after a data set on the performance of the variety of at least three years has been tested by the SQCC. The submitted information has to include a summary of varietal characteristics, morphological characteristics (size, shape, color, etc.) and a recommendation domain and seed supply situation. The NSB was constituted in order to advise the government of Nepal on national seed policies and is divided into three sub-committees:

- 1) The **Variety Approval, Release and Registration Sub-committee (VARRS)** consists of one SEAN representative and eight members from the private sector and is responsible for:
 - a. Preparation of policies/ guidelines for submission, evaluation, approval, release and registration of varieties

- b. Making recommendations to the NSB for release and registrations
 - c. Planning seed multiplication
 - d. Promoting private sector development of new varieties
 - e. Making recommendations on the de-notification of outdated varieties
- 2) The **Program planning/formulation and Monitoring Sub- committee (PMS)** consists of one SEAN representative and eight members from the private sector and is responsible for:
- a. Formulating programs for the supply of seed to meet national requirements
 - b. Monitoring production and consumption of seed
 - c. Arranging production of foundation seed and certified seed
 - d. Coordinating private and government sector production , sales and distribution
 - e. Fixing seed prices
- 3) The **Quality Standards Determination and Management Sub-committee (QSDMS)** consists of one SEAN representative and eight members from the private sector and is responsible for:
- a. Recommending quality standards to the seed board
 - b. Publishing the minimum quality standards for seeds

(SQCC, 2015)

Seed Production

Seed production in Nepal is carried out through contract seed production by various public and private actors: the National Seed Company Ltd. (NSC) which is a public seed company, private companies, NGOs, the governmental District Seed Sufficiency Program (DISSPRO) and government farms and stations. In all the above cases farmers are contracted to multiply seed in return for money. The NSC is involved in production, processing, storing and selling (including import and export) of seed. The private seed sector features around 900 registered seed companies and entrepreneurs (IFPRI, 2011). DISSPRO was established by the government to encourage the production of quality seed. In the cause of this program farmer seed producer groups were founded or already existing farmer groups were facilitated in seed production. The objective was to produce enough seed in each district to meet the seed demands of the respective district (Crop Development Directorate, 2015). According to the International Food Policy Research Institute, in 2011 the total of these organizations accounted for the supply of approximately ten percent of the seed demand. Research on and production of hybrid varieties is due to *'a lack of trained human resources, infrastructure and investment in both the private and public sector'* (National Seed Vision 2013- 2015) a rather unattended aspect in Nepal. Breeder seed and foundation seed is generally supplied by the Nepal Agricultural Research Council (NARC), which is the official government body in charge of agricultural extension and research. Some private companies do however have a license to produce their own source seed. Since established as the result of a private initiative in 1889, SEAN plays a prominent role in organizing the production and marketing of improved seed in Nepal (Poudyal,

2014). It features a wide range of members from the national seed sector: seed companies, seed traders, seed importers and seed producers (e.g. farmers groups) but no governmental actors. SEAN also established its own seed company, the SEAN Seed Service Centre Ltd. (SSSC), which produces vegetable seed of 49 improved open pollinated varieties and seed of two different hybrid tomato varieties. With support from international donor agencies, it is also involved in research on improved open pollinated vegetable and maize varieties.

Policies and structure

The major laws and regulations related to the Nepalese seed sector are the national seed act, established in 1988 and the national seed policy, established in 2000. The prior one provides a national law on seed and the latter one includes principles to permit the seed industry to strengthen the private seed sector in order to promote a more independent national seed sector (IFPRI, 2011). In the area of research and extension additionally to NARC, international agricultural research centers united under the Consultative Group on International Agricultural Research (CGIAR) are involved in research including the introduction of germ plasm and research capacity building. The Department of Agriculture (DOA) is by use of its sub divisions, the District Agricultural Development Offices (DADOs) in charge of public extension services (IFPRI, 2011). Also donor-aided programs and I/NGOs, such as Oxfam Great Britain are involved in various seed related activities like agricultural extension, seed research and variety development.

Marketing

The main marketing channels in the Nepalese seed sector are direct selling and selling through intermediaries. Direct selling occurs mainly in the informal seed system when the seed is directly sold from producer to consumer, that is, from farmer to farmer. The seed producers within the formal system are in most cases contract growers employed by seed companies. Therefore the seed companies and their contract growers are somewhat to be perceived as one actor in the marketing system. Usually there are one or more intermediaries placed between the actual producers, respectively the seed company and the end consumer. These intermediaries are the retailers: cooperatives and Agro-Vet stores. Also independent business men, so called seed dealers purchase seed from growers act as brokers and sell it to retailers (Ghimire and Pimbert, 2013). Cooperatives and Agro-Vet stores are frequented by direct customers: farmers or retailers which operate small agricultural supply stores in remote rural areas. Cooperatives do, similarly to seed companies, distribute seed to contract growers, collect the next generation of seed and either sell directly to the end consumer or to an Agro-Vet store. At the Agro-Vet store one can purchase all sorts of input necessary to run an agricultural enterprise. The usual stock includes fertilizer, pesticides, fungicides, nutrient supplements, fodder and medical supply for livestock and seed from local varieties, seed from improved open pollinated varieties and seed from hybrid varieties, all from national or multinational companies. Next to being a transfer site for agricultural supplies the Agro-Vet store also constitutes a meeting point for farmers and a place where one can get advice from the shop keeper as well as from other farmers. It is a precondition for running an Agro-Vet store to have

graduated from either agricultural or veterinary studies. Also unofficial boarder trade with India does play a role in the seed supply of Nepal. There are however no specific records kept on transaction volumes.

The informal seed system

Nepal's informal seed system is similar to those of other countries constituted by households, farmers' groups and Community Seed Banks (CSB). It is characterized by farmer to farmer exchange of small amounts of seed, either as gifts, for money or for other seed or grain (National Seed Vision 2013- 2025). In Nepal, the seed produced and circulated within the informal system does account for the largest amount of seed used for the production of the major food crops rice, wheat and maize. The prevalence and specific use of the informal seed system is varying all over Nepal according to the accessibility of the areas. So are the farmers in remote areas deep in the Himalayas, often days of walking away from the next town, more reliant on informal seed sources than those living close to urban areas with sufficient infrastructure ((Pandey et al., 2011).

Since informal seed supply systems do diverge in their distinction I will use information derived from my field research in this section to describe the characteristics of the informal seed supply system I encountered. Therefore it only describes the informal seed sourcing mechanisms of a specific group of people in a specific geographic context and cannot be generalized for the whole of Nepal. Also the seed sourcing mechanisms differ from crop to crop. In the present case I distinct between vegetable seed and cereal (wheat, maize, rice) seed. The interviewed persons used formal and informal sources for the acquisition of cereal seed. Vegetable seed is mainly sourced from retailers. Generally, the prevailing source of seed amongst the interviewed is the formal system in form of Agro-Vet stores or cooperatives. One farmer stated: *'we do not buy [seed] from other places. We bring from Anamol³ or we store. Or sometimes if some neighbors have the best breed [variety] we ask [seed] from them'*. This statement indicates that the informal source 'neighbor' is rather used to try out new varieties which seem to perform well at the neighbor's field than for covering the entire seed supply. Others do not address their neighbors at all for seed: *'we have our own seed, so it is not needed [to approach the neighbors]'* as one farmer made his standpoint clear. Generally, even if not interested in receiving seed from others every farmer stated to always provide seed (in small amounts) when asked for it, as long as the own demand has been covered before. The form of giving the seed however differs from individual to individual. Some generally only exchange seed against money, others generally provide it as a gift and others do interchange between both options depending on the relation to the person who asked for seed. I have been told, if *'they are near ones, dear ones or relatives we will exchange, if it is far [the relationship] we will also sell'*. Hardly anyone stated to exchange seed for seed: *'I do not bring [seed] from the neighbors, I bring from the Agro-vet only. I am afraid that it will be mixed up by all kinds of different seed so I want to buy the pure one'*. The interviewed farmers tend to replace their seed approximately in a frequency of two to four years since *'I have experienced that the seed will grow well up to second and third generation and after that it will not grow well. It will be affected by disease or it will be mixed. So then I buy again'*. In the years they do not acquire new seed, a share of the harvest is kept in the house in order to re-plant in the following season. One farmer also explained to keep seed at his house for security reasons: *'if I don't find any good variety at the cooperative then I use the seed of my own house'*. All those

³ 'Anamol' is used by the farmers as a shorter form of 'Anamolbiu Pvt. Ltd.'

statements indicate that the use of informal sources for seed is declining within the interviewed population.

CHAPTER 3- ANAMOLBIU PRIVATE LIMITED

3.1. Setting the scene



Figure 4: Operating sites of Anamolbiu Pvt. Ltd. (source: Presentation Anamolbiu Pvt. Ltd.: A Glimpse. 2014).

Anamolbiu Pvt Ltd. (Nepalese for ‘precious seed’) was officially registered as a private seed company in 2010. It operates in various districts of Nepal (see Figure 4) and breeds and markets seed of different crop varieties. Anamolbiu Pvt. Ltd states on its’ website to be involved in research and development activities and that this involvement is driven by the perceived need to contribute to the improvement of food and nutritional security of disadvantaged communities in Nepal (Anamolbiu, 2014). The company offers seed-related trainings and consultancy services to its contract growers and is engaged COB) activities. COB is an approach widely been given distinction by John Witcombe, who understands it as the combination of participatory and non-participatory breeding activities. Part of COB is the interactive participation (Pretty, 1995) of farmers in the breeding and variety selection process. This means that the farmers are not only asked for their wishes, ideas and opinions concerning the traits of new crop varieties but actively participate in analyzing and evaluating the performance of a crop variety in process and together with the company staff plan the consecutive

steps. In the concept of COB however not only the opinion of the producer (the farmer) is important but also the one of the consumer. Anamolbiu Pvt. Ltd arranges gatherings at mills of the different villages during which civilians have the possibility to taste the produce of new varieties that are in process and give their opinion on for example taste and cooking duration and quality. After a new variety is developed and registered with the Seed Quality Control Center (SQCC) in Kathmandu it can be released to the market and seeds of the variety can be produced on a larger scale. Since its' establishment Anamolbiu Pvt. Ltd. developed an extensive network throughout the whole country. The company sells vegetable, cereal and legume seed to 14 cooperatives and 15 Agro-Vet stores in 35 districts (see Annex). Opposed to most seed companies in Nepal which are either vegetable-based or cereal/legume-based, Anamolbiu Pvt Ltd combines both components. The company facilitates three points of interaction between formal and informal seed system within its' own supply system: at the point of variety selection and development, at the point of seed multiplication and at the point of marketing it. The seed multiplication is carried out by contract growers⁴. Finally, the product gets sold via Agro-Vet stores and cooperatives all over the country or directly at the company's site offices. Anamolbiu Pvt. Ltd. currently runs two activities without farmer participation: seed multiplication of an F1 hybrid tomato line and the development of a new hybrid tomato variety. They however plan to involve farmers into hybrid seed production at a later stage.

The company has a tight linkage with the Nepalese NGO Local Initiatives for Biodiversity, Research and Development (LI- BIRD). LI-BIRD has been part of a Research-Into-Use (RIU) program funded by the UK based Department for International Development (DFID). This program ran in various African and Asian countries in the time between 2006 and 2012 as a follow up of the DFID Renewable Natural Resources Research Strategy (RNRRS), a global 11-year program, which ended in March 2006 (Final Report, research into use, University of Edinburgh, 2006). The aim of the RIU program was to scale up agricultural innovation. In a report of IFPRI and FAO (2014) innovation is defined as *"the process by which social actors create value from knowledge"* (Thornton and Lipper, 2014, p.15). Building up on this, agricultural innovation can be understood as the process by which social actors create value from knowledge on agricultural practices. The RIU program aimed on enhancing resilience and food security of small scale farmers in the face of ongoing changes in climate and environment. The introduction of COB activities through LI-BIRD and Forum for Rural Welfare and Agricultural Reform for Development (FORWARD), another Nepalese NGO, has been part of the RIU program. Both NGOs have established a seed company through which the varieties developed in the course of the RIU programs can be maintained and distributed on the national seed market. Anamolbiu Pvt. Ltd. is the seed company that emerged out of LI- BIRD's participation in the RIU project and remained tightly linked with the NGO. Unfortunately it was not possible to get information on how the seed company that emerged out of FORWARD developed after finalizing the RIU program.

⁴ *'Contract farming can be defined as agricultural production carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and marketing of a farm product or products. Typically, the farmer agrees to provide agreed quantities of a specific agricultural product. These should meet the quality standards of the purchaser and be supplied at the time determined by the purchaser. In turn, the buyer commits to purchase the product and, in some cases, to support production through, for example, the supply of farm inputs, land preparation and the provision of technical advice'* (FAO, 2015).

Social Responsibility

According to the former manager of Anamolbiu Pvt. Ltd., the company does not only employ farmers or makes use of their knowledge but also makes an attempt to use seed as a medium to transfer knowledge to them. At the beginning of the work relationship between Anamolbiu Pvt. Ltd. and the COB participants and contract growers, the farmers get a small training on seed production respectively breeding and variety selection. The training slightly varies in content for the two different groups (contract growers and COB participants). The contract farmers get a basic education in various basic aspects of agricultural production. Anamolbiu Pvt. Ltd. staff pointed out: *“we usually tell the farmers that growing the same crop or even the same variety year after year may bring the chances of more disease incidents and soil depletion and so on, so you have to alter the crop. After two or three years you have to alter so there is a proper balance of nutrients in the soil “.*After attending the training of Anamolbiu Pvt. Ltd., the company’s contract farmers are able to determine the:

- adequate time for sowing and transplanting
- adequate time for rouging⁵
- adequate times for field inspections

“Such kind of practices, such kinds of technologies can benefit the farmers on their own cultivation as well. Wheat or rice seed production, or lentil or bean seed production is only the means. Along with the seed production we are transporting the knowledge.” This statement emphasizes the fact that the farmers get educated and taught not only how but especially why to perform a certain agricultural activity. In the COB program the farmers gain additional basic knowledge on plant breeding (see Chapter 3.3.). The reactions of the COB farmers to the interaction with Anamolbiu Pvt. Ltd. are consistently positive. One farmer started his own small scale trial for an improved paddy variety after he had stopped participating in the company’s COB activities due to lack of labor after his son moved out. Even though not participating in the company’s COB program anymore he feels that he can always approach the company staff for advice when necessary. One farmer stated: *‘I want to get more knowledge about the seed [of Anamolbiu Pvt. Ltd]. If it is nice then I will also grow [it] in my other land. If it is practical, then I will know it by myself’.* Another person stated: *‘I am interested in new ones [varieties], doing different, better things, not only the popular ones [varieties], I want to know if it [the new different varieties] can be nice or not.’* In those comments it becomes obvious how much the farmers appreciate and are interested in and triggered by the possibility to learn something new. The education process continues throughout the entire growing season. Regular staff visits create a personal relation which is given distinction by trust and solidarity between the farmer and the company.

Social responsibility, the ethical concept of an individual or groups of individuals to have the responsibility to consider the benefit of the society at large when acting, plays an important role in Anamolbiu Pvt. Ltd.’s operations. Transferred to the business world this concept is known as Corporate Social Responsibility (CSR). It is usually defined as *‘the social involvement, responsiveness, and accountability of companies apart from their core profit activities and beyond the requirements of the law and what is otherwise required by government’* (Chapple and Moon, 2005, p. 416). The website of Anamolbiu Pvt. Ltd. which is the only means by which the company presents itself to the

⁵ Rouging is the removal of off-types in a seed production plot. This is very important since pollen from off-type plants can cause irreparable damage through cross-pollination

public, features a section on social responsibility. Here the company expresses its' commitment to ethical business practices and research and development activities. They do however not offer any more detailed explanations. To me, Anamolbiu Pvt. Ltd.'s corporate social responsibility becomes most obvious in its research activities. It works on the development of nutrient rich crop varieties with the superordinate aim of improving food security in Nepal (see also Chapter 3.3. for details). Also the fair treatment of the COB participants and contract farmers, such as timely and just payment and the transfer of knowledge are important to the company. These aspects as well as the responsibility towards the customers to produce quality seed belong under the umbrella of CSR. Those are not actions and responsibilities the company has to take as required by law, but does voluntarily out of moral consideration.

3.2. Company organization

Shareholders

Anamolbiu Pvt. Ltd. is owned by a total of 35 shareholders (level of information of 2014). The biggest share of almost 50% belongs to LI-BIRD as an organization (see Table 4). The remaining part is carried by private persons: LI- BIRD staff, Agro-Vet shop holders and Community Based Seed Producer Groups (CBSP) and general members. Also some of the members of Anamolbiu Pvt. Ltd.'s Board of Directors (BoD) own shares in the company. This is however not compulsory.

One share equals 400 000 Nepalese Rupees (NRS) which is at the time of writing an equivalent of about 3700 €. This is a large amount of money for a single private person to come up with, which is why one share can also be purchased by several individuals. Individuals who would like to purchase one or more shares of Anamolbiu Pvt. Ltd. together can ally with other individuals in groups of 16 (each with NRS 25,000 respectively about 230 €), eight (each with NRS 50,000 respectively about 460 €), four (each with NRS 100,000 respectively about 920€) or two (each with NRS 200,000 respectively about 1860€). According to the Chief Executive Officer (CEO) of Anamolbiu Pvt. Ltd. most of the individuals have invested NRS 25,000 each. Thus, there are many individual investors but a limited number of shares. So far, Anamolbiu Pvt. Ltd. has not made net profit. However in the past two years of its operation, it has been making gross profit. According to the CEO of Anamolbiu Pvt. Ltd. it will take at least another three to five years before the company can start to distribute dividends to its shareholders.

Type of Shareholders: Share & Equity



Types of Share-holders	No of individuals	Shareholder No	Equity based share (%)	Amount (Rs.)
LI-BIRD	1	1	49.3	140,00,000
Agro-vets and CBSPs	14	13	19.4	55,09,128
General members	24	13	19.4	55,09,128
LI-BIRD Staff	82	8	11.9	33,79,310
Total		35	100	283,97,566

Organizational Structure

Table 2: Shareholders of Anamolbiu Pvt. Ltd. (source: Presentation Anamolbiu Pvt. Ltd.: A Glimpse. 2014).

At the top of Anamolbiu Pvt. Ltd. stands the BoD, constituted by seven individuals: one chairperson and six regular members. The BoD is responsible for '*policy decisions, business development, external linkages and company and staff issues*' (progress update Anamolbiu Pvt. Ltd., March 2012). Part of the BoD is the delegated management team consistent of the CEO and the marketing manager. The focus of the delegated management team lies on strategic operations and decisions on day-to-day basis. Subordinate to the BoD are the in total 12 staff members of the company's three different operation sites (see Figure 4), with the majority being stationed in the head quarter in Chitwan. The supply chain of Anamolbiu Pvt. Ltd is to a large extent vertically integrated: the company has a license to produce its own breeder seed, seed multiplication is performed by contract growers under supervision of the company and transport as well as processing and marketing of the seed is carried out by Anamolbiu Pvt. Ltd.. The marketing activities of the company are however focused on retailers and part of the input (foundation and breeder seed) is provided by NARC. These two steps in the chain are not entirely integrated and performed by actors from the external network of Anamolbiu Pvt. Ltd.

External network

Figure 5 displays Anamolbiu Pvt Ltd.'s external network. The company collaborates with different government actors such as NARC which is responsible for the registration of new varieties as well as the provision of source seed. The term source seed is used as a synonym for breeder seed, which is '*seed or vegetative propagating material directly controlled by the originating, or in certain cases the sponsoring plant breeder or institution, and which provides the source for the initial increase of foundation seed*' (Idaho Code, 2010).

The second governmental body the company is involved with are different District Agricultural Development Offices (DADOs). These DADOs are part of the Department of Agriculture under the Ministry of Agricultural Development and responsible for agricultural extension work. In some areas, the DADO staff takes over the task of paying monitoring visits to the fields of Anamolbiu Pvt Ltd.'s contract growers.

Cooperatives and Agro-Vet stores are the retailers the company works with to sell the seed they had produced by farmers groups or individual farmers. In some cases Anamolbiu Pvt. Ltd. assigns the responsibility of monitoring, supervision and distribution and collection of seed for one seed multiplication area to an individual they trust. Only the last monitoring visit before harvest is carried out by Anamolbiu Pvt. Ltd. staff which as well determines the time of harvesting. In Parsa, a small town around 30 kilometers from the company's headquarter, Roman Chaudhary owns an Agro-Vet store. He has a good and personal relation to Anamolbiu Pvt. Ltd. and already works with the company for many years. He is assigned to take care of the contract growers in his area in terms of

monitoring and offering assistance. He explains: “we have a type of coordination, like I have told to Gurung- Sir [production officer] that I will look after the seed production program here in this area it will be very good for you [Anamolbiu Pvt. Ltd.] and for me also because my Agro-Vet here it will also run well after I see this program because the farmer will come to my Agro- Vet and it will also be good for Anamol because I will look after the seed production program here. It’s a type of agreement between us and that’s why in this area all the seed producers they are directly linked with me”. Those retailers also seasonally provide the company with information on the demand (which varieties of which crops have been bought, which complaints were voiced, etc.) for seed from farmers’ side. This information is requested by Anamolbiu Pvt. Ltd. from the Agro-Vet stores and used to plan the production for the subsequent year.

As already touched upon, Anamolbiu Pvt. Ltd. emerged as a consequence of the RIU project LI-BIRD has been part of. Three of the seven members of the BoD of Anamolbiu Pvt. Ltd. are LI-BIRD staff and the CEO is also program operations director at LI-BIRD. In some cases, LI-BIRD staff takes over certain tasks for Anamolbiu Pvt. Ltd., mainly monitoring and supervision of the variety selection process in the COB activities. In Jhapa, where Anamolbiu Pvt. Ltd. runs its COB activities, LI-BIRD was running a Participatory Plant Breeding (PPB) project before the Anamolbiu Pvt. Ltd. site office was opened in 2010. The staff that used to work at the LI-BIRD office is the same that now coordinates and supervises the activities of Anamolbiu Pvt. Ltd. “it is like the name has only changed, the persons are still the same, so it is the same” as one COB farmer puts it.

The company is also cooperating with several NGOs. One example is the cooperative DAFACOS (Dadeldhura Farmers’ Cooperative Society) which takes part in the ‘Enterprise Development Program’ by Oxfam. The former marketing manager of Anamolbiu Pvt. Ltd. explained: ‘they [DAFACOS] have a long history in seed production and marketing. So, in the production of vegetable seed in that district we contacted them and we established a contract with them’. This cooperation entails the outsourcing of certain activities such as monitoring and supervision of the seed multiplication process to an NGO or cooperative (similarly as it is done with LI-BIRD and some of the farmers). In areas where Anamolbiu Pvt. Ltd. does not have an own office, this approach allows them to still enhance their production and product range to more distant areas without being physically present constantly.

Academic Institutions such as for example the Institute of Agriculture and Animal Science of Tribhuvan University, Nepal do assist the company in their research related endeavors.

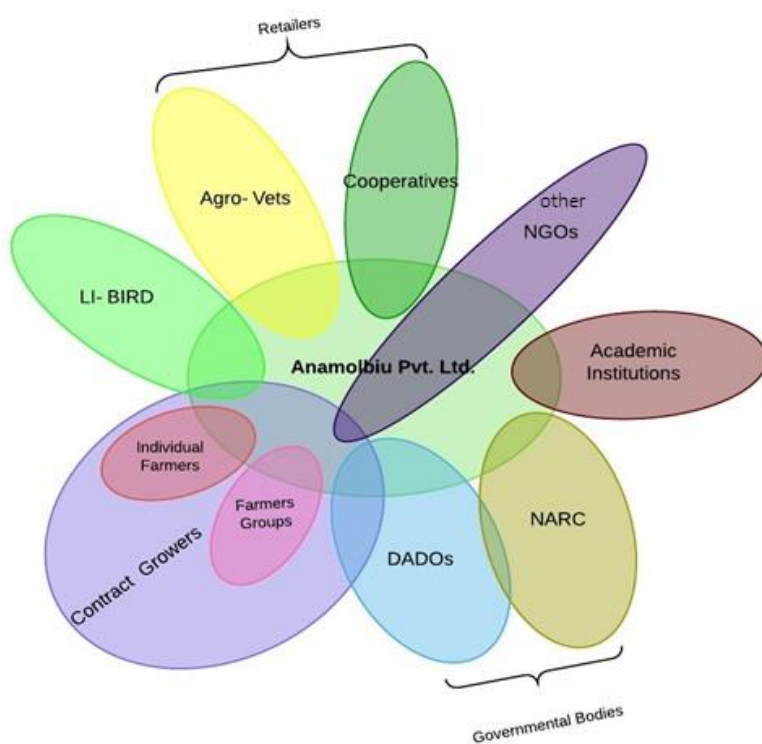


Figure 5: Anamolbiu Pvt. Ltd.'s linkages and interrelations

Research and Development

Anamolbiu Pvt. Ltd. states on its website to be one of few Nepalese seed companies with a '*strong research and development focus*' with the aim of '*improving food and nutritional security of disadvantaged communities in Nepal and continually providing better options to farmers*' (<http://www.anamolbiu.com/r-n-d/>).

To reach this aim the company carries out four research activities, as according to its website: (I) Collection and assessment of germ plasm of **Heirloom Vegetable Varieties** on agronomic performance and exceptional features. This is done in an attempt to enhance agrobiodiversity and similarly to preserve important parts of the Nepalese '*culture and identity*' (<http://www.anamolbiu.com/r-n-d/>). A heirloom variety is '*a traditional variety of plant or breed of animal which is not associated with large-scale commercial agriculture*' (Oxford Advanced Learner's Dictionary). (II) Field testing of **Late Blight Tolerant Potato Lines** in cooperation with LI- BIRD. Late blight of potatoes '*is caused by the fungus-like oomycete pathogen *Phytophthora infestans*. It can infect and destroy the leaves, stems, fruits, and tubers of potato and tomato plants*' (Fry, 1998) and has been a continuous problem in Nepal (Shrestha, 2000). (III) **Preliminary seed multiplication of a Beta Carotene Rich Tomato Variety**; Beta-carotene is an antioxidant which protects the body from free radicals which damage cells and can over time lead to chronic illnesses. Also, beta-carotene is changed to vitamin A in the body which is contributing to a strong immune system (University of Maryland Medical Center, 2015).

Client Oriented Breeding

The COB program of Anamolbiu Pvt. Ltd. also belongs under the umbrella '*Research and Development*'. I however decided to present it in a separate sub-chapter since the program and the people involved in it have been part of my field research. Anamolbiu Pvt. Ltd. carries out variety selection and breeding of rice varieties with 20 farmers in Jhapa District (see Figure 4). Also in Jhapa, 39 contract growers do rice seed multiplication of varieties developed through COB activities.

The variety development method used in the COB program is called bulk breeding. With this method it takes around eight to ten years to develop a new rice variety. The first step is to select parent plants and cross them. This step is performed for various potential new varieties at the Anamolbiu

Pvt. Ltd. office with the interactive participation of selected farmers. In the second year, F1 plants (first generation) are grown in a trial plot, self-fertilized plants are removed by hand through the farmers and the F2 seed is harvested. This step is carried out in farmers' fields. These farmers are chosen by the production officer on the basis of their land characteristics and interest. Each of the farmers provides a small piece of land. This land is distributed into equally sized parts. On each of the plots one trial line is grown. Anamolbiu Pvt. Ltd. pays the farmers an amount of money which is equal to what they would have been able to earn by using their land for paddy cultivation. From the third to fifth year, the F2 and F3 plants are grown in those plots and harvested in bulks. From these bulks, composite samples are taken and the process is repeated. In the fifth year, F4 seed (so from the previous year) is sown and plants with desirable traits are selected and harvested individually, F5 seed is generated. In the seventh year rows with single plant progenies are grown, uniform and promising plants are selected and each row is harvested in bulk. In year eight to ten, field trials with the selected progenies are conducted. Again, the most promising ones are selected. The trials are repeated to finally select the best performing one as new variety. The selection process is almost entirely done by the farmers, they however discuss their decisions with Anamolbiu Pvt. Ltd. staff during regular monitoring visits. It is the company staff that has the last word. Throughout the growing season, the production officer of Anamolbiu Pvt. Ltd. passes by the farmers on a fortnightly average. At each visit, the Anamolbiu Pvt. Ltd. staff and the farmer inspect the field together and share their opinion on the performance of the crop. The former manager of Anamolbiu Pvt. Ltd. explained that in the COB program, all operations right from the selection of the parent until harvesting are executed in close collaboration with the farmers *'right from the vegetative stage we will do the screening of those progenies with our and the farmers knowledge'*. The farmers show great interest in gaining knowledge on new production techniques which they might be able to use for their own operations as well. The staff is responsible for paying monitoring visits and supervision of crossing, selection and harvest of the crops which is executed by the farmers (Mahendra Chaudhary, Interview 14.11.2014). After running through the lengthy selection process, for three subsequent seasons a sample of seed of the chosen variety is to the head quarter in Chitwan and from there to the NARC, where the quality is assessed. After the data of three seasons plus at least two seasons of data from farmers' field trials are collected they can be submitted to the SQCC which decides whether the variety is ready to be released.

Contract Farming

The general approach of Anamolbiu Pvt. Ltd. concerning their contract farming arrangements is to work with either farmers' groups or cooperatives or individual farmers. A farmers' group is built up very similarly to a cooperative in terms of members and activities. It differs however concerning legal arrangements. The main difference is that a cooperative is linked to the government and therefore also gets more input from the official side. *'There are more facilities [e.g. subsidies] for cooperative given by the government. Also, the cooperative run according to the rules of the government, but the farmers' group runs by the decision of its members. But we don't want more profit, we want to have our own body controlled by ourselves!'* one farmer explained the difference to me. The marketing manager of Anamolbiu Pvt. Ltd. explained me that there are mixed farmers' groups as well as pure women groups but no pure men groups since *"men are lazy (laughs) or they are outside the country"*.

Anamolbiu Pvt. Ltd. currently employs 125 growers contracted for seed multiplication of rice, wheat, maize and potato in Chitwan and 160 growers for multiplication of rice, wheat and lentil in Nawalparasi. These two districts are adjoining. The company's headquarter is situated in the municipality Bharathpur, Chitwan, approximately a thirty minutes bus drive from the district boarder of Nawalparasi. From here, Anamolbiu Pvt. Ltd delegates the marketing operations and processes and keeps track of monetary transactions. Additionally to the Marketing Manager and the Head of Finances, one production officer who supervises the seed production activities is positioned here. Chitwan is also the place at which the processing of the entire volume of vegetable seed produced all over the country is carried out. Improved seed of 15 different vegetable and legume varieties is produced by 296 contract farmers in six different districts. The processing includes grading, sorting, packaging and labelling of the seed. Also cereal seed produced in Chitwan is processed at the company's head quarter. This is done by a group of seasonal laborers from within the municipality. From here, the company operations of Anamolbiu Pvt. Ltd. within Chitwan as well as the adjoining district Nawalparasi are coordinated. Anamolbiu Pvt. Ltd. interacts with individual farmers and farmers' groups which either grow breeder or foundation seed for the company. Anamolbiu Pvt. Ltd. employs two different options here:

- 1) Provision of e.g. 100 kg of foundation seed for free. Supposed the farmer produces 1000 kg of improved seed and returns this amount to the company, he will be paid for only 900 kg.
- 2) Provision of seed on a subsidized rate. Supposed the market price for foundation seed is 100 NRS per 1 kg, the farmer will receive 1 kg for 50 NRS.

Option one enables farmers with insufficient resources to get engaged in seed production. This coincides with the moral principles of Anamolbiu Pvt. Ltd. (see Chapter 3.1.). It however requires a certain degree of loyalty between the farmer and the company. The former marketing manager of Anamolbiu Pvt. Ltd. explained: *'with farmers who do the seed production with us for a long time, this system is no problem, but farmers who only recently started to work with us, they may not be loyal enough'*. He continued to elaborate that some farmers would lie about the amount of seed they produced and sell it to other recipients when offered a slightly better price. Option two therefore provides the company with a minimal level of security in case the farmer does not stick to the contract. Generally, Anamolbiu Pvt. Ltd. offers the farmers a buy-back guarantee. This means that the company takes the same amount they handed out back and every additional produce can be sold to the company by the farmers. The price a farmer can procure by selling seed to Anamolbiu Pvt. Ltd. instead of selling grain to the local market is almost 1.5 times higher (R.B. Rana, Interview 2014). The farmers' groups and Anamolbiu Pvt. Ltd. close a written contractual agreement on how much seed can be produced on a certain area of land, then they calculate how much foundation seed is needed. After harvest, the responsibility of transporting the seed to the company's office is in the hand of Anamolbiu Pvt. Ltd. which is highly appreciated by the farmers since it saves them time, money and labor. The farmers get paid the latest 14 days after delivering their produce. They receive a fixed price which has been agreed on upfront in a written contract. This is another feature noted positively by the farmers since in interactions with local business men, often no written agreements exist and negotiated prices are not complied with. One farmer explained: *'they [local business men] took the paddy from me and first they just look at my paddy and say I will give this and that much of NRS, about 10 NRS per kg- let's say on Sunday. And when I took that paddy to the wholesaler next Monday they had changed the price to only 8 NRS, just deducted this amount. So I had to quarrel with them, it was too tedious!'* This implies that working with Anamolbiu Pvt. Ltd. provides the farmers

with a safe and stable income, slightly higher to what they would earn by selling grain to the local market.

In the course of the growing season, the production officer of Anamolbiu Pvt. Ltd. pays regular monitoring visits to the fields of the contract growers. Generally three visits occur, one during the vegetative growing stage, one at 50% flowering stage and a final one before harvest. The purpose of this last visit is to estimate when it is time to harvest the crop. Still, in some cases those monitoring visits and field inspections are carried out either by experienced farmers or agricultural technicians from the regional DADO. *'Because in Nepal people have small land holdings. If we want to do the seed production in 100 ha we have to find 100 farmers so to say. We cannot visit all those households. We will visit ten to 15. Some of the farmers are very progressive, some of the farmers have a long experience so they do these tasks [monitoring and field inspections] on a local level.'* In these cases the production officer gets regular updates on the phone from the contact person. This is however only possible for improved seed production as here the sole responsibility for the quality of the produce lies on the company itself. When it comes to breeder and foundation seed, regional labs or government authorities are responsible: *'for breeder seed and foundation seed production we will call them prior we have to send them [the regional lab] our detailed seed production plan. And they schedule certain times when they visit our fields and only after their inspection, we are allowed to harvest'* I was told by the former marketing manager of Anamolbiu Pvt. Ltd. After the seed has been harvested by the farmers' group or individual farmers it is collected and brought to the head quarter in Chitwan, where samples are taken. Those samples are sent to a laboratory and tested according to the following criteria (I) Physical purity (small in size, swollen, broken husk...), (II) germination percentage, (III) moisture and (IV) quality/ purity (same varieties) to assess the seed quality.

Hybrid Seed Production

In the hilly areas of Kaski district, close to the district capital Pokhara, Anamolbiu Pvt. Ltd. runs the company's only production site without farmer participation. Here, two main activities take place: production of F1 tomato seed of the variety Srijana, a Nepalese hybrid variety, the source seed (the parental lines) is provided by NARC and the improved open pollinated seed production of different vegetable crops. The production site is physically isolated by being situated between high hills and far from other crops to prevent cross pollination and is only reachable through a two hours walk through the mountains, passing steep hill slopes and patches of jungle. Once reached the 3.3 hectares big site one sees 32 tunnels all dedicated to the production of F1 tomato seed and five improved open pollinated tomato varieties (HR31, HR32, HR35, HR40). Next to this, the site is used for breeder seed production by Anamolbiu Pvt. Ltd. of:

- Kentucky wonder, French bean
- Bhaktapur local, Cucumber
- Srijana, Tomato
- Radish, 40 days
- Zapu- II, Cauliflower
- Minu , Radish early

- Manakamana, Mustard
- Khumal green, Mustard
- Yellow tomato types (with Beta Carotene)

A year ago, the development of a second tomato hybrid variety with the parental lines supplied by an American company has begun; Anamolbiu Pvt. Ltd. has plans to extend their business across the nation borders. The BoD of Anamolbiu Pvt. Ltd. prefers to keep the name of that American company private until the production of seed from the hybrid variety in process has started. The reasoning that stands behind the production of hybrid seed and the development of a new hybrid variety is that the company needs to be able to compete with the big multinational companies on the seed market which mainly sell seed of hybrid varieties. The company carries a responsibility towards their shareholders to generate profit. The Nepalese seed sector is congested with hybrid vegetable seed from all over the world, which is readily taken on by the consumers. In order to continue to be competitive and maintain the focus on research, food security and equitable involvement of all actors along the entire value chain it is necessary to engage in such activities as well (Ram Bahadur Rana, Barun Acharya, interviews 2014). This statement is complemented by the view of the president of SEAN. He explained that there are few Nepalese hybrid varieties for any crop, which is why the country is highly dependent on other nations for the procurement of hybrid seed. Being close by and hosting many multinational seed companies, India is the main supplier for hybrid seed. He continues his argument by putting the lack of Nepalese hybrid seed in relation with the so- called ‘*brain drain*’ of the country and the insufficient activities and course of action of the government:

‘There is no incentive for any breeder to develop a variety- what does he get? Only the monthly salary, nothing. Some recognition should be there for this type of work otherwise no scientist will be interested in doing it. Nobody takes care for the hybridization that is why our country is not getting any new variety in hybrid.’

By the time of my visit the land was being prepared for the construction of four additional tunnels. A pipe and sprinkler irrigation system, fed by a water harvest tank is in place and transports water to all tunnels and open plots. This site has been established in 2010, four years prior to my visit, and the production of tomato seed started with six tunnels. There is no office building, but two of the three permanent staff members live with their families in small houses at the site. The other permanent staff member and the additional nine temporary staff members live in a village two hours by foot from the place. Although the breeding and production side is officially run by Anamolbiu Pvt. Ltd., the monitoring (at least once a month) is carried out by a LI-BIRD staff member who is specialized in plant breeding. He pays the permanent and temporary staff their wages, brings material (e.g. bamboo sticks, foil, plastic, nets, baskets and the like for maintenance of the tunnels and irrigation system) and provides technical supervision. All the materials have to be carried by foot since the production site is not accessible with a vehicle. The reason this task is not performed by Anamolbiu Pvt. Ltd. staff lies in the close proximity of the LI-BIRD headquarter (one hour by public transport) and in the close relation of LI-BIRD and Anamolbiu Pvt. Ltd.. The activities undertaken here are the manual, labor intensive cross pollination of plants, operation of nurseries, the grading of tomatoes and the fermentation and drying of the seed. Also those activities are all performed manually. The grading and fermentation process are performed in a simple way. All staff members gather next to the tomato harvest. One person cuts the tomatoes in half and distributes them over various plastic containers. Two or three people take the tomato halves out of the plastic container and remove the soft material which covers the seeds and put it into sealable plastic containers. The remains are disposed. Once filled up, the sealable containers are left in the sun 24 to 30 hours for fermentation. Subsequently, the liquid is removed and the seed dried under a net. Finally the seed is taken to the Chitwan headquarter for treatment with fungicide, packaging, labelling and further distribution.

Seed Distribution

According to the Marketing manager of Anamolbiu Pvt. Ltd. the seed that generates the highest income the one of vegetable crops, specifically the hybrid tomato seed. The company sells two gram (approximately 400 seeds) of this seed for 260 NRS (2.44 Euro) and set the maximum retail price at 325 NRS (3 Euro) which accounts to a kilogram price of 130 000 NRS (1 220 Euro) and 162 500 NRS (1 525 Euro) maximum retail price, respectively a profit of 32 500 NRS (305 Euro) for the retailer. The former Marketing Manager of Anamolbiu Pvt. Ltd. Barun Adchary told me: *‘Have you met this Agro-Vet at Pokhara? There is one guy who is one of the top seed entrepreneurs in Pokhara, he told us two years back, Anamol can even produce 50 kg [hybrid tomato] seed per year he will take all those seeds. That implies there is a high demand of hybrid seed’*. The price for one kilogram of paddy seed however ranges between 30 to 45 NRS (0.28 to 0.42 Euro), which is why even though a large amount of kilograms of paddy seed is produced and sold, it still remains the seed with the worst revenues (Uttam Adhikari, Interview 2014). The general financial development of the company has been positive from the very beginning.

Additionally, the company is supplier for two different projects of LI-BIRD on agricultural development:

- 1) Diversifying Availability of Diverse Seeds (DADS) Project.** This project is jointly implemented by LI -BIRD, Anamolbiu Pvt. Ltd. and NARC with a runtime of three years from 2013 to 2016 in three districts namely Bara, Kaski and Jumla with financial support from Biodiversity International and the Swiss Development Cooperation. The project aims to reduce the vulnerability of small-scale family farmers through enhanced diversification of seed and clonal material production and distribution systems (LI-BIRD, 2014).
- 2) Innovations for Terrace Farmers in Nepal and Testing of Private Sector Scaling Up Using Sustainable Agriculture Kits (SAKs) and Stall-Based Franchises.** This project is as well implemented by LI- BIRD and aims to test and promote need-based commercial technologies and information from around the world to raise livelihoods, reduce female drudgery and increase resilience to climate change by piggybacking onto an existing stall-based network and by distributing through local vendors for agricultural products (Agro-Vets) considering a private company as a major vehicle (LI-BIRD, 2014). It is scheduled for three years from 2014 – 2017 with Anamolbiu Pvt Ltd and the University of Guelph as partners and funding from the International Development Research Centre (IDRC).

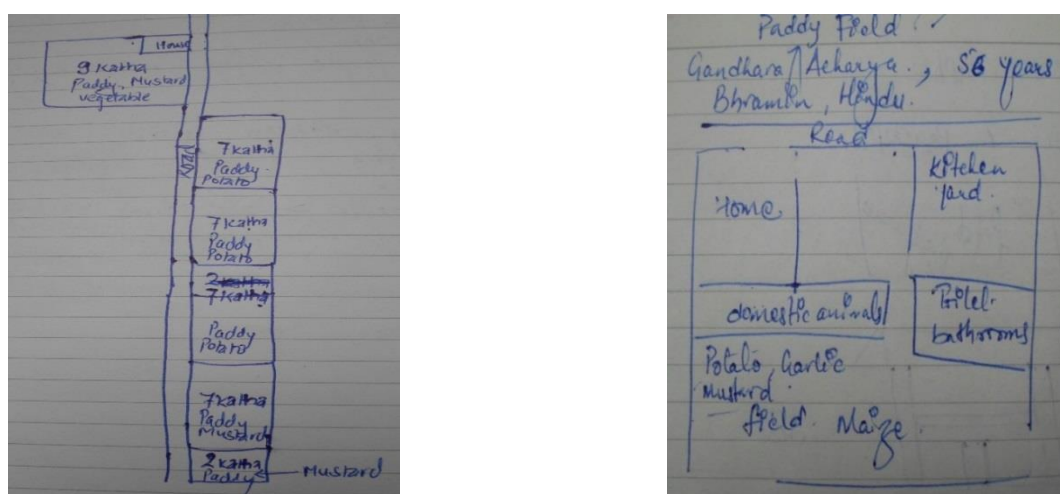
3.4. Synopsis

This chapter aimed on providing an overall understanding of Anamolbiu Pvt. Ltd. by presenting its internal setup, its external network, its activities and operating philosophy. One red thread that goes throughout the company's short history is the connection to LI-BIRD. Starting with the establishment of Anamolbiu Pvt. Ltd. as a result of LI-BIRD's efforts. It continues with the support through LI-BIRD staff in various operations and the relations to the seed producers and ends with LI-BIRD being a frequent customer of the company. LI-BIRD also supports Anamolbiu Pvt. Ltd.'s research activities on hybrid tomato lines. These activities are considered as vital for the financial development of the company. Anamolbiu Pvt. Ltd. also shows to dispose of certain structured planning capacities by requesting information on the seed demand from their retailers to plan for the upcoming season. Further this chapter indicated that Anamolbiu Pvt. Ltd. does take its social responsibility serious: the company's research activities aim on enhancing food security, the contract farming arrangements are set up in a way that allow also resource poor farmers to get engaged and the transfer of knowledge is essential to the company.

CHAPTER 4 – THE ORIGIN OF THE SEED

4.1. Introduction

In total I visited four different places to interview contract growers of Anamolbiu Pvt. Ltd.: three villages in the surroundings of the city Narayangarh in Chitwan and one town in the neighboring district Nawalparasi, where a farmers group has a contract with Anamolbiu Pvt. Ltd. for seed multiplication. In Jhapa I visited three different places in the vicinity of Surunga, the trade capital of the district to interview COB participants. All interviewed farmers live in villages consistent of approximately 300 households. This is a relatively small size: everyone knows each other at least from sight. Both sites are situated in the geographical region Terai and have similar climatic conditions. Although located almost 500 kilometers apart, the village and household compositions appeared very similar to me: when reaching the margin of the city (Narayangarh as well as Surunga), the roads are slowly getting smaller and unpaved. Houses are scattered in the paddy fields most of them approximately 500 meters apart from each other. Those houses that are built closer to the roads are also built closer together, some almost directly attached to each other only separated by the respective kitchen gardens. A kitchen garden is a small garden close to the house in which secondary food crops such as fruit and vegetables are grown for domestic use. Here the family grows what they need for their daily consumption: mustard, garlic, cauliflower, green beans, kidney beans, gourds, chili and some other crops and herbs. Most farming households sell vegetables from their kitchen garden if there remains a surplus after covering the household's needs. Customers are either other villagers or people from the nearby towns who pass by those farms directly to purchase. Sometimes local businessmen pass by to purchase vegetables and then sell them to a slightly higher price in town on the market. All farms I visited were operating on a small scale with an average of 0, 5 to 2, 0 ha (see picture 1) with mixed and integrated farming systems on subsistence level. Most families own two or three cows and/ or water buffalos for milk production. The milk is either sold off-farm to fellow villagers or to a dairy company in the nearest town or used for home consumption. Since slaughtering and eating goats is an essential part of a number of Nepalese festivals, many farmers own two or three goats which are sold during the festive season for consumption purpose.



Picture 1: Sketched farm maps of two Anamolbiu Pvt. Ltd. contract growers



Picture 2: Home of a COB farmer, close to Durgapur, Jhapa



Picture 3: Paddy fields of different varieties (harvested and standing crop), close to Durgapur, Jhapa

The average house has four to five rooms and is home to three generations of one family. Most households are connected to the power grid. Electricity is mainly used for lighting inside the house and charging mobile phones. Toilets are available in form of latrines outside the house and water is brought up from boreholes by manual pumps. Most households I visited had their own pump which is also used for irrigation of the kitchen gardens and fields close to the house. All farmers that I visited in the course of this research were living in rather simple but still decently equipped houses with not more than two or three rooms shared by several persons. In the Nepalese culture it is customary for the wife to move in with the parents of her husband after marriage which is why usually the grandparents, husband and wife and three to five children live together in one house. It is common for all family members to be equally engaged in the manual work on the farm. However, in many farming households, the labor force that can be mustered is not sufficient anymore to fulfil all incurring tasks. The reason for this as stated by the interviewed farmers is that in most families many children leave their parents' house in order to go studying in the bigger cities or even leave the country for education or employment abroad. One farmer explained:

"it's only the two of us, husband and wife. We have three sons both of them went abroad for labor and one son has got married and one daughter has also married and left. Daughter in law comes sometimes and helps. Our son is living in another place but his wife is here, coming to help. The sons also send some money sometimes for expenditures".

The absence of labor from within the family is not perceived as a big problem, since it can be replaced with paid labor from outside the family. This is possible due to remittances from family members abroad. It has become a common practice in the Terai region to hire seasonal migrant workers from India during the peak seasons of transplanting and harvesting rice. The farmers I encountered during this research apply the same livelihood strategy: generating additional income through various different activities. One farmer for instance owns a public vehicle, others run small shops, offer their services as tractor drivers or one family member works in the nearby town as a shopkeeper or the like. One major input, however are the already mentioned remittances from abroad. Every family I talked to has at least one member working or studying in a foreign country *"the kids they go abroad and send the money, it is a very popular system of earning money these days in Nepal, they go to Malaysia, Qatar, like that."*

4.2. The interaction between company and farmers

The Role of LI-BIRD

As already mentioned, Anamolbiu Pvt. Ltd. emerged as a result of a LI-BIRD project. This means that from the very beginning on the company was equipped with well trained staff, a purchaser for their produce (LI-BIRD's development projects) and a base of contract growers and COB participants already acquainted with the company's work. The farmers know the staff members for a long time and place a lot of trust in them. One man told me *"we are just like brothers! Sometimes we talk about the families we are happy just like that. We trust them, they are family!"*. Not only personal sympathy of the kind that has been expressed in the previous statement but also the feeling of having learned something, of getting connected to the modern world so to say, is something that the farmers associated with LI-BIRD and transferred to Anamolbiu Pvt. Ltd. One farmer expresses it like this: *"The process of cultivation is a traditional matter, it has not been modernized until now. But nowadays they start doing those things [modernizing agricultural production through the provision of seed of improved varieties, modification of sowing and weeding practices]. [Also] the crossing is a modernized method so we are knowing this from these organizations only, not from the government. Only because of LI-BIRD and Anamol we have been like this. Otherwise no one would know about this [the crossing of varieties], we are very thankful that LI-BIRD came"*. This statement not only indicates the positive opinion the farmers have about Anamolbiu and LI-BIRD but shows that there is no real differentiation made between the two actors by the random use of both names. This implies, that Anamolbiu Pvt. Ltd. is accepted and associated with positive developments by the farmers since they had already established a personal relationship with LI-BIRD before and now somewhat transferred this feeling of trust they had for LI-BIRD to Anamolbiu as a company.

Benefits from working with Anamolbiu Pvt. Ltd.

When being asked for their reasons to start working with Anamolbiu Pvt. Ltd., among the contract growers most farmers stated to have basically copied their neighbors' activities. They observed their neighbor's field, noticed that the crop standing in the field was very healthy and the production was high and consequently inquired at their neighbor's about his or her choice of variety. They were asking for the origin of the seed, sometimes for a small amount of seed to try it on their own field and would adopt the new variety without further inquiry. However, in three of the four interview locations in Chitwan, I met one farmer each who distinguished himself a bit from the others by showing a lot of interest in different agricultural production techniques. One example is the farmer Devi Jung Gurung from the village Prembasti in Chitwan. He is a likeable, open man in the middle of his fifties and head of a 12 person family. He owns two fields, a big and a small one of in total 2 Bigha and 17 Kattha (approximately 2 hectares) on which he grows paddy, maize, mustard and some legumes. He is a contract grower for paddy seed for Anamolbiu Pvt.Ltd. He is part and initiator of a small village committee which concerns itself with communal issues such as paving roads, get light

on the roadside and the like, things the ‘government does not take care of’ according to him. His interest in different and innovative agricultural practices becomes obvious when taking a look around his farm- he owns a small biogas plant and a pigeon loft. Also in the sourcing of seed he was always more innovative than others. *“Earlier, in earlier times I used to bring seed from Parbatipur, a place which has small, small cooperatives which produces the seed, quality seed- do you know? And I used to bring seed from eastern part of Nepal also and western part “.* These examples imply that Devi Jung Gurung is a person who is trying to find different ways of doing things, who is open to new activities and ideas.

“I experienced something with my neighbor: when I changed the seed [meaning variety] and I brought the seed from Bhaydabhar in the western part of Nepal, there is a governmental research station for producing the seed; I brought that paddy seed from there and I tried it in my field and the same person [the neighbor] brought seed from Bhaydabhar and tried it in his field. After a while, I changed the variety which I brought from Bhaydabhar but that person continued for 7 to 8 generations!! And only when the production declined he asked me that oh my production declined what do I do? And then he calls upon me. And then I took the seed from last year from Anamol, that type of seed I use in my field and gave him a little bit to try and now this neighbor also uses the seed from Anamol”.

It seems that the neighbor in this story based the decision on which rice variety to grow to a great extent on what he saw Devi Jung Gurung doing, who is according to himself and the Anamolbiu Pvt. Ltd. staff known as a progressive farmer in his village. The neighbor copied his choice of rice variety and showed no intention to change this variety until it declined in production. At that point in time he again approached Devi Jung Gurung. This implies that he places trust in the more progressive farmer and his decision making in agricultural production.

These ‘progressive farmers’ are often also more venturesome farmer and showed to be a sort of nodal point in their communities from where the dissemination of knowledge and information on new practices starts. So also in the case of Anamolbiu Pvt. Ltd. those were the first in their communities to start working with the company. In the following I will display some statements of Anamolbiu Pvt. Ltd.’s contract growers that indicate why they perceive the interaction with Anamolbiu Pvt. Ltd. as beneficial for them.

High productivity

One answer that I received in unanimity throughout all interviews to my question of what is nice about the seed of Anamolbiu Pvt. Ltd. is: *“the good productivity!”* Above I introduced Devi Jung Gurung who described this with the words *“it’s just like magic!”*. Others got more precise: *“it is like if we divide: earlier I used to get 2 portions, now I get three portions. I think I get 25% extra”*. One farmer stated that with the seed from Anamolbiu Pvt. Ltd. he can produce more paddy on his upland whereas the seed from other companies does not perform so well under the same conditions apparently. This higher productivity plays an important role for the farmers, they connect it to economic benefits and the consequential improvement of their livelihood.

More Income and reliability

Closely related to the previous point productivity is the point of being able to generate more income through being involved with Anamolbiu Pvt Ltd.. The difference between what a farmer can earn from selling one kilogram of rice grain for consumption and one kilogram of paddy seed can be up to 50%: *“for example the seed producer farmer they can earn 50 Rupees per kg but the non-seed producer they earn only 25 Rupees per kg”*. This however varies from farmer to farmer depending on the variety he grows, where and whom he sells to, the area he lives in etc.. I was also told that the difference lies only at four to five Rupees more that is gained from selling to Anamolbiu Pvt. Ltd.. Others said 30 Rupees. Generally it can be said, that selling seed to Anamolbiu Pvt. Ltd. is more profitable than selling rice grain for consumption to the local market. Another aspect that was mentioned is that Anamolbiu Pvt. Ltd. other than independent seed dealers takes all seed at the same time and also pays for the entire amount at once, while sticking to the agreed price. The contract growers are paid according to the previously agreed conditions latest two weeks after they delivered their produce. Anamolbiu Pvt. Ltd. takes over the responsibility of picking up the seed themselves or provides compensation to the farmers and thereby allows the workers to save time, money and labor force. One farmer stated:

‘I am very satisfied with Anamol. In earlier times when I used to sell paddy with business men they give less price than Anamol. And also while carrying those paddy sacks on my back and while carrying them to the shop, they [the business men] didn’t give any kind of labour cost but Anamol are giving. So I am satisfied with them. And they give all the payment at one time but those business man they give payment in instalments.’

Quality

There are different ways in which the interviewed farmers perceived that the rice seed they produce for Anamolbiu Pvt. Ltd. (and thereby in most cases also the rice they consume themselves) was of higher quality than the seed of the varieties they used before and acquired from different sources such as Agro-Vet stores, cooperatives or agricultural supply stores across the Indian boarder. One farmer stated: *“Before also I used to plant rice but I used to plant local rice varieties. The milling percentage was very low as compared to the seed I have brought from Anamol Seed Company. The milling percentage⁶ is very high and I can have high produce also.”*. Others mentioned the high weight of the grain and the healthy and strong visual appearance and uniformity of the standing crop grown from seed which was obtained from Anamolbiu Pvt. Ltd. as a positive quality feature. There is an overarching consensus on the importance of *“quality seed for production and productivity”* among the interviewed, whereby the seed from Anamolbiu Pvt. Ltd. is considered as *“quality seed”*. Grain weight as well as high milling percentage are variety characteristics. This implies that through

⁶ Milling percentage is the percentage of unbroken rice grain that remains after removing the husk and bran layers from paddy grain through milling

Anamolbiu Pvt. Ltd. some of the farmers do have access to seed of rice varieties they do not have access to otherwise. Those farmers who used the same variety they had used before working with Anamolbiu Pvt. Ltd. with the same replacement frequency did also state that the crop from the company's seed performs better. This could be related to not optimal storing of seed by the retailer, resulting in seed of different varieties being mixed together or older seed mixed with new seed or even seed of different varieties.

Practicality

Apart from increasing productivity, income and quality the connection with Anamolbiu Pvt. Ltd is also perceived as being practical. Firstly practical in a sense of consistency and security. One farmer stated *"it's easier to get the seed from Anamol than from neighbor because we can get seed from there whenever we need and also in addition to that, if we have some economic problem we can get some advance money also from there. And we can sell our whole produce to them it's better for us to sell to Anamol than at other places"*. Others mentioned the length and texture of the straw is of good quality which makes it possible to use it as livestock fodder and even sell it as such to others and thereby generate extra income. What is also perceived as handy, is that Anamolbiu Pvt. Ltd. comes to the farm to pick up the seed which saves the farmer the cost for a troublesome transport when selling. It was also stated that it is *"nice to be with an organization who will know if there is some problems, they will help us."*

Curiosity and knowledge

In Jhapa, Anamolbiu Pvt. Ltd. has taken over the previous office and staff of LI-BIRD in Surunga. The NGO is busy with Participatory Plant Breeding (PPB) activities in this area since approximately 7 years. The varieties used for seed multiplication resulted from the activities of LI- BIRD. In two other districts, Chitwan and Nawalparasi three, respectively five contract growers multiply rice seed from varieties developed through COB respectively PPB activities. Surunga is the trade center of Jhapa District and borders to India to its' eastern and southern side. The Surunga office is rather small with two staff members. Overall, the current activities entail seed multiplication of paddy (monitoring, initiate harvesting, seed collection and storage), wheat and kidney bean (grading, treating and packaging) and the marketing of paddy, wheat, kidney bean, mustard, lentil and vegetable seed. Additional to these activities the staff is responsible for the procurement and collection of breeder seed for wheat, kidney bean, lentils and maize. At the time of my visit, the production officer was engaged with identifying suitable farmers for the seed multiplication of wheat, mustard and lentils.

I visited three different villages in the close proximity of Surunga. All three villages can be reached by a combination of public transport and walking in approximately two hours and are built up similarly. When trying to find out, why specifically a farmer would start to work with a private seed company like Anamolbiu Pvt. Ltd. in breeding and variety selection, I found people with similar backgrounds:

individuals which distinguished themselves a little bit from the other interviewees by showing a lot of interest in different agricultural production techniques. People, who have been amongst the first in their areas to apply a new technique, try out a new crop variety etc. One has been nominated as active farmer by the local DADO office, another one has attended many training programs from various governmental and non-governmental organizations and yet another one is leading a committee for the development of his village's infrastructure. Also the farms of these persons did show, that they had a lot of interest in and were open to trying new things. They had their own small biogas plant, pigeon lofts or started their own paddy breeding activities inspired by the work with LI-BIRD and Anamolbiu Pvt. Ltd. This indicates a high interest and curiosity towards gaining knowledge and adapting new practices which they also stated as main reasons to work with Anamolbiu Pvt. Ltd. Some of the farmers that were engaged in breeding and variety selection activities did at the same time work as contract growers for Anamolbiu Pvt. Ltd.. Those farmers who were involved in both, the COB and seed production activities also stated thirst for knowledge as a motivation to start interacting with Anamolbiu Pvt. Ltd. One farmer nicely said: *'I do it for the new knowledge and secondly for the money!'* They are eager to learn new techniques and hope to apply them also at other parts of their farms. *"We were seeking for the new things. We thought we will learn new things, new seed, and new processes. We were really interested in learning more about agriculture so we went there"*. Generally, all of the farmers who are involved in both activities, COB and contract growing have mentioned many things they learned through the interaction with Anamolbiu Pvt. Ltd. concerning the improvement of their agricultural practices such as how to separate different paddy varieties in the field, how to cross paddy, which crop is suitable for which soil type, to practice line sowing instead of seed broadcasting and the like. All of them are willingly passing on what they learned to their neighbors and relatives. One farmer told me: *"they [fellow villagers] were thinking, that when they grow [paddy], when they mix all the seed and sow it, then the crossed variety will come. So we taught them it is not like that. We told them, from one seed you take the male part, from another one you bring the female part and you combine them"*. One farmer proudly told me that he was the name-giver of the meanwhile registered and released paddy variety *Anamol Masuli*. This is an incentive that encourages participation and is at the same time a respectful gesture that symbolizes the appreciation and importance of the farmers' input throughout the variety selection process

4.3. The social configuration of the farming communities

Social cohesion

The strong feeling of belonging together as a group is a prevalent one amongst all of the interviewed persons. The accounts of the interviewees are similar in all seven different places I visited. Many respondents expressed that they feel strongly connected to their fellow villagers and perceive them almost as family members. It is for example common for the inhabitants of one village in Jhapa to gather to worship together. One farmer told me: *“They all are there, everyone can meet. We dance a lot. We all know them there it will be very nice, we enjoy this life”*. But people do not only come together to dance and worship, the conviction that the welfare of the group is most essential goes beyond the boundaries of religion, caste (in Nepal, the term ‘caste’ is not only used to describe the hierarchical structures within the society but also to describe the belonging to a certain ethnic group) and origin, the importance lies in the perception of the group as an entity that can and should experience and achieve things together. One farmer, also from Jhapa, stated:

“Every work we do together, while working on the farm we work together, also [at] the house of the neighbor we work together, in the field also. Whenever we are sick, we will be together. Whenever we have a marriage ceremony or anything we will do together!”.

Still, there is also a common notion of realizing that those moments of interaction become less within the communities. The farmers relate that with the process of labor migration to foreign countries.

“It has been changing over the years. All of us used to be here earlier, but now many of us are going to foreign countries for the labor and some are going [to the cities] for the offices. We do not have time for much interaction and it [interaction] is a bit less nowadays but we help each other anyways”.

One farmer from Nawalparasi explained that even though in his village he does not perceive a strong bond between the people they would still help each other, since it is part of their culture. This can also be linked to the concept of ‘Karma’⁷ which is an integral component of the Hindu culture. Even though people seem to feel some notion of togetherness, it also appears as if the things that enable such a feeling to develop (e.g. casual daily interactions, common worshipping etc.) are perceived to be slowly changing. More and more people have access to higher education which helps more and more people to get better paid jobs within the country and abroad. This brings more money in the communities and where traditionally individuals did depend on each other and on their community

⁷ In Hinduism, Karma is understood as the sum of a person’s actions in his or her present and past live(s) which determines his or her fate after being re-born. This is the reason why people are trying to be helpful and respectful towards each other.

as a whole do now depend to a higher degree on their family members abroad. As one farmer from Chitwan indicated:

“Because 10 to 12 years back all the people remained in the same country, same village same site, same conversation with each other. They used to ask each other for help, for labor, for pesticides, insecticides, for workers for the agricultural practices. But nowadays these old structures are broken and really weakened because all the people, maximum, even boys even girls they used to migrate from one country to another country, they are going to foreign places for study, for work, for other purposes, so they get money, remittance is increasing. In this country people only depend upon the people who are working in other countries, they depend upon brother, son or husband they rely totally on their money. So they are thinking that it is not necessary anymore to make linkage with others and ask for the money and other help”.

Even though not relying so much on each other for help and assistance, interpersonal interaction has shown to still be an integral part of everyday life in the farming communities I visited. During the interviews I could observe the way in which people were interacting. It is common to just pass by the neighbor's house for a chat or to stop on the way to talk to other people from the village who are just passing by.

Sharing Risks and Benefits

When talking to the farmers, I noticed that all of them seem to care to a great extent for the general good of their community. This bears as a consequence that a farmer who had a positive experience with for example a new farming practice will want his fellow community members to benefit from it as well so that the entire community can progress. Many of the interviewed explained to feel this way and therefore willingly share any new knowledge they gain with the others: *“I am very interested in farming. Since I was 18 years I was active in farming, so I want to make everything very productive and beneficial for all of us. I want to do it for myself and also for others members in my society, I want to uplift those farming systems so I am very interested in those things”.*

Also the members of the farmers' group who is registered as seed producer group in Nawalparasi, are open to include non-members into their activities since they feel it is important for everyone to learn more about the right handling of seed in order to increase production and prevent soil depletion, which again are factors that concern the entire community. Also in relation to Anamolbiu Pvt. Ltd. this is an interesting notion, since as one farmer makes good experiences with the company he or she will want his or her neighbors to contribute as well and try to encourage them to also get engaged in seed production. However, in one neighborhood where the interviewed farmer was the only one to work with Anamolbiu Pvt. Ltd. and only did so for a few years, the other members were reluctant to follow his advice *“because they might be thinking that it's a troublesome process bringing seed from there growing and returning the seed to the same company”.* Also in terms of assisting each other a great loyalty within the communities is noticeable. Many farmers told me that for example in the case that someone has to be admitted to the hospital the other community members will collectively bear the costs for transportation, food and medication and only after recovery it will be discussed how the favor can be returned. One lady from Chitwan said: *“from the*

village, one can come from the other side. This village is big, it has many people so they can help, they can do anything!". This also indicates that the lady feels secure in the environment of her village. Also interviewees from Jhapa stated: *"they will help up to what they can do, whatever is possible they will do. They would give in the sense of money or in the sense of strength anything they want to have, that is how everybody is, everybody will help"*. One can literally feel the trust this person has in the rest of his community to be there in times of need, the security that the group will be there to bolster if necessary. Next to those interpersonal relations that were experienced to provide a feeling of security also more official security institutions are in place. In all 7 all communities I visited, I found a group or village committee that was set up by community members and serves at the same time as a driving force to sustain for example the infrastructure of the community (paving streets, collecting waste, installing road lightening etc.) as well as constituting a simple insurance system. Every member has to pay a certain amount of money once per month which flows into a common fund. This fund is used to either render projects such as the ones mentioned above or to provide loans to individuals who are in a situation which makes them reach their financial borders.

Reciprocal labour relations and mutual assistance

Other than the mutual acts of helping each other in times of need, there is one overarching common relation of mutual assistance- the practice of 'Parma'. Parma (or *Parima*) is a Nepali term and defines the exchange of labour for labour, a reciprocal labour relation. Literature on indigenous labour relations in Nepal suggests that the exact understanding of what Parma is, is quite extensible (Fortier, 1993). This matches with what I found at the site of my field research. Parma can be given from individual to individual, from household to household, only to relatives, to friends or simply to every member of the village. Which way is chosen seems to depend on the individual case and is backed up with specific reasoning. This concept of reciprocal labour exchange was widely practiced and is commonly known in the villages I visited. Interestingly it is not used in its 'pure' form (labour for labour) as much as in earlier times anymore. It seems that a changing mind set, a change in priorities of the farmers constituted by increased access to information and the 'rest of the world' has provoked a change in the way that this traditional practice is performed. There also seems to be a turn from a more traditional model of society in which the children stay at the parents' house and contribute to the wellbeing of the family by providing their force for labour, towards a society in which children leave the family and turn towards employment in other sectors and do instead of with their man power support their families with money they earned in the cities or abroad. These developments are also reflected in the transformation of traditional practices, in this case the Parma system. One farmer I spoke to explained:

"There are no people to give Parma and to take Parma also, so I depend upon the money only. There is Parma between other people but between myself and other neighbors there is not any Parma system because in my house there is no any member helping for Parma so I have to depend upon money and take the [hired] labor and use in peak season".

This person has various different sources of additional income. He is a contract grower of Anamolbiu Pvt. Ltd., sells some rice grain as food product to local businessmen, sells paddy seed to his neighbors and receives remittances from his three sons who live abroad. This is not an uncommon arrangement in Nepal and it shows that in many cases it is becoming easier to get access to money than to labor

force from within the family. With this money it is possible to employ seasonal migrant workers mostly from India during the peak season such as harvesting and planting time.

However Parma is still a common notion, something everyone is familiar with, but most of the people I talked to stated that they do not do it anymore for various reasons. One cause was, that when taking 'Parma', one has to wait until others are done with their own work on the field, so that they have time to come and help out. This holds the danger of being too late for some agricultural practices and thereby the risk of making losses.

4.4. Synopsis

This chapter introduced the social configurations of the farming communities interviewed and identified changes within those structures. The use of those structures have modified over time. The farmers relate those modifications mainly to the more readily available monetary resources available through the increased number of people leaving the country for work and education. The way that farmers interact with each other are subject to continuous change. Reciprocal labor exchange is a well-known concept but became rare since it is possible to hire workers. This again relates to the availability of remittances from abroad. Social cohesion is strong within the farming communities and interaction an integral part of everyday life. The traditional social structures still exist, but are now used differently: what is passed on through them is rather information than seed or labor.

CHAPTER 5-WHO BUYS THE SEED?

5.1. Introduction

The intention was to interview customers of Anamolbiu Pvt. Ltd who are not related to the company through friendship, blood relationship or working relation in order to understand who buys seed of Anamolbiu Pvt. Ltd. This however turned out to be impossible since none of the interviewed had a concrete idea of which seed company they were buying. They stated they only ask for 'good' and 'productive' seed. In the case of cereal crops such as rice and maize they also asked for a specific variety but never for a company. My impression was affirmed by all five Agro-Vets I spoke to. After talking to those Agro-Vets it became clear that farmers note little or no difference in yield when growing crops (vegetables and cereals) from seed of the same improved open pollinated variety offered by different companies. Also the prices that different companies ask for seed do not differ significantly.

According to the Agro-Vets farmers distinguish between 'hybrid seed', 'improved seed' and 'local seed'. The farmers as well as the Agro-Vets I spoke to, used the term 'hybrid seed' to describe seed from a hybrid variety, 'improved seed' to describe seed from improved open pollinated varieties developed through formal breeding programs and 'local seed' for seed from landrace varieties. The Agro-Vets indicated that most farmers are not completely aware about the properties a seed originating from any of those different categories has. One Agro-Vet gave an example: *'He [a customer] doesn't have a lot of knowledge about [what] hybrid seed [is]. He only sees the small package and some label with hybrid written on it. But if the seed is sold lose and he uses it, he thinks that it is not hybrid'*.

Even though according to this Agro-Vet the farmers who buy seed do not have a lot of specific knowledge on the different seed categories, farmers do use those categories to describe which seed they want to purchase. Since Anamolbiu Pvt. Ltd. mainly markets 'improved seed', so seed from improved open pollinated varieties (OPVs), understanding who decides to buy seed of improved OPVs and who seed of hybrid varieties also contributes to understand who potentially buys Anamolbiu Pvt. Ltd's seed.

The first round of interviews revealed that the persons who purchase seed in the Agro-Vet store are not aware of which company they are buying and do also have no interest in knowing. One Agro-Vet stated: *"there is only 1 or 0, 5 % of people asking for [a specific] company. Most people only ask for the specific variety or they just ask for 'improved seed' or they want 'hybrid seed'"*. The outcome of all interviews implies that for paddy seed farmers ask for certain varieties but never for a certain company. Similarly for vegetable seed: also here varieties are not of importance to the farmers, only whether the seed is 'good'. Individuals that are involved in commercial vegetable production form an

exception. During the observation of the Agro-Vet customers my translator explained to me that she had noticed that commercial farmers do ‘*mostly ask for hybrid seed of international companies*’. The Agro-Vet added that “*from the Nepali [seed] companies, only Gorkha seed and SEAN seed are a bit progressed in production of vegetable seeds and commercialized farmers also ask for them. Not for those seeds [from companies] like Anamol*”.

Most of the interviewed farmers however simply ask for ‘*good seed*’. Usually the Agro-Vet uses the germination percentage printed on the seed package label to judge whether a seed is ‘*good*’ or not. According to all Agro-Vets, most of the farmers buy seed from improved OPVs for paddy cultivation and do not see a difference in quality and price between what different companies offer. Since there is no perceived difference between different companies and Anamolbiu Pvt. Ltd. produces seed from open pollinated varieties, I asked the farmers about their seed sourcing behavior in general and not specifically concerning Anamolbiu Pvt Ltd. One Agro-Vet explained:

“Look, just like all of the producers and farmers and government organization produce the same type of paddy, so there is not much difference in the quality all have same type of production, same type of quality. There is no difference in yield and quality so why depend on that specific company?”.

He also stated though that sometimes farmers do remember the package of a seed they really liked and ask for the same seed again in the subsequent season. Other Agro-Vets mentioned however that the farmers rather remember when seed did not perform well, so for example had a low germination percentage or the package content had been mixed with seed from other crops or stones and on the basis of that voice complaints and ask for different seed.

5.2. Variety use

Table 3 presents the pattern in which the interviewed population uses seed from landrace varieties, improved open pollinated varieties and hybrid varieties. What is noticeable here is that seed from hybrid varieties is largely used for commercial production of vegetables or for the production of maize as livestock fodder. The reason, as stated by the interviewees, is the high productivity of crops grown from seed of hybrid varieties, for vegetables as well as for maize (“*we put the same amount of seed, but we get more output!*”). The taste of vegetables grown from seed of hybrid varieties however is not perceived as good. For maize the resistance to pests and diseases was criticized. According to the farmers, vegetables and maize grown from hybrid seed have been affected more frequently by pests and diseases in the growing period. Also after harvest, the crops have been shown to be moldy or dusty earlier than crops of improved OPVs or landrace varieties.

One person stated: “*I ask for good seed, local seed ... Local seed for cauliflower and not this hybrid because I use this vegetable only for my family not for selling. Local is sweet*”. In the case of this study this local seed was saved by farmers or kitchen garden owners and then sold to Agro-Vets who sell it in small hand packed packages without label (see Picture 5). These seeds are only used for vegetable production for home consumption. Vegetables grown from these seeds are amongst others Ladies’

fingers/ Okra (*Abelmoschus esculentus*), bitter gourd (*Momordica charantia*), bottle gourd (*Lagenaria siceraria*), Kidney bean (*Phaseolus vulgaris*) and the like. One of the interviewed Agro-Vets explained:

“People don’t use hybrid for home consumption but for animals. For their home consumption they use local [and improved open pollinated] varieties and they use hybrid maize to sell to feed companies, like poultry feed and so on. For cow farms or buffalo farms. Local varieties don’t have much weight and the production is also less. But for home consumption it is better because the taste is good and keeping quality is also good. But [harvest from a crop grown from] hybrid [seed] can’t be kept for a longer period of time. Yes, it is difficult to store hybrid maize more than three months”.

According to the interviewed Agro-Vets, the main amount of seed bought is seed from improved open pollinated varieties. All Agro-Vets stated to make the most profit selling seed from hybrid varieties.

Table 3: Variety use of Agro-vet customers in Narayangarh, Chitwan District

Landrace Varieties	Improved Open Pollinated Varieties	Hybrid Varieties
<ul style="list-style-type: none"> • Production of vegetables for home consumption 	<ul style="list-style-type: none"> • Production of paddy for commercial purpose and home consumption • Production of paddy for home consumption • Production of vegetables for home consumption • Production of maize as livestock fodder 	<ul style="list-style-type: none"> • Production of vegetables for commercial purpose and home consumption • Production of vegetables for purely commercial purpose • Production of maize as livestock fodder

Farmers prefer to use seed from improved open pollinated varieties for different purposes. Crops grown from those varieties are (equally to those grown from landrace varieties) perceived as being tastier than the ones grown from seed of hybrid varieties. Further the general opinion among the interviewed is that seed from open pollinated varieties is ‘good seed’. It delivers a productivity which is satisfactory to the farmers and likewise has an acceptable price-performance ratio. There is a big price difference between paddy seed from open pollinated varieties and paddy seed from hybrid varieties. One farmer said: *“Hybrid [paddy] seed costs 500 NRS per kg but the improved local paddy [seed] only costs 30 or 40 NRS per kg. So most of the people can’t afford the hybrid”.*

5.3. Seed sourcing

The interviews of which the results are presented in the following sub-chapter were conducted in five Agro-Vet stores of the city Narayanghar, Bharatpur (which is the capital of Chitwan District) and one Agro-Vet store in the town Parsa, Chitwan. The Agro-Vet stores in Narayanghar are located in one long street which begins at a junction, close to one of the biggest bus parks of the city. Towards the other end, that street leads out of the city and towards the peri-urban and rural areas. While interviewing and observing in the different Agro-Vet store, I was told that depending on where exactly along this street the Agro-Vet store is positioned, the type of customer varies. In a store close to the beginning of the street, one finds more walk-in customers who quickly stop by to buy a small amount of seed since they are already in the area. Others come because they are in search of a very specific chemical, nozzle or advice which they know only to find at this one certain shop. The Agro-Vet stores towards the more rural end of the street rather have retailers come who have shops in the rural areas and need to replenish their stock or farmers who come with the specific purpose to acquire seed. The majority of the customers I interviewed had access to monetary resources. More than half of the respondents had at least one family member abroad who sends money. One lady had a husband in the Indian Army, one man had been working in Dubai for some years and saved some money. The remaining either had a side job or a son or daughter with a side job. Those with no other source of income than farming were selling parts of their harvest on the local market. One respondent stated to consume all of his harvest and cover other expenditures with money from his side job.

Seed sourcing frequency

Paddy

The interviewed Agro-Vet customers had basically five different frequencies of purchasing seed. Surprisingly the overall pattern is to purchase new paddy seed from open pollinated varieties every year. The main reasoning behind that is that the productivity of the seed will decline when it is not changed regularly. One farmer explained:

"My farming experience taught me that we must change the seed every year. If we can't change the cropping pattern just like this year paddy, this year another crop we must change the field. Everything must be changed and in the same way we must not use the same seed which is stored in house."

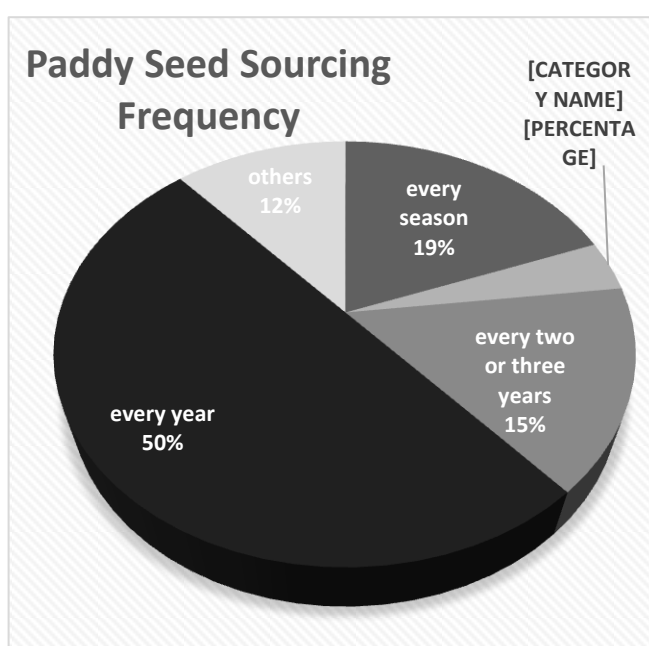
Another person stated:

"I think that after changing the variety we will get more profit and production. Because of all the pathogens and the environmental factors that affect the produce, so I want to change it every year".

Yet another person asked me why they should store the seed in their house instead of buying "the good seed" from the Agro-Vet store, now that there are those stores and cooperatives that offer seed. It was also referred to the quality of the seed that can be bought at the Agro-Vet store.

"If I kept the seed myself it didn't work properly. Every time I buy the seed from this Agro-Vet and go to my field all the crops are growing! "

Others state that they do not have proper storing facilities in their houses, so the seed gets attacked by fungus, pests and the like and thereby reduces in quality and quantity. According to the interviewed farmers, seed brought from the store has a high germination percentage, does not take up space in the house and is easy to access. In some cases the farmers do not only replace the seed with a newly purchased one but also change the variety they are growing. Two farmers told me that they alternate between two varieties each season. They stated do this for the same reasons as others buy new seed from the same variety. They have the strong conviction that change in the field is important to retain a healthy crop and high yields. Every farmer I talked to in the course of this research told me this. One farmer presented a more exceptional argument for not storing seed which was that he had only recently moved to the Terai from the hills and therefore simply does not know how to store seed under the conditions within this area.



other person said to

There is still a small number of people among the interviewed farmers that have a different seed replacement frequency. Amongst all people interviewed at the Agro-Vet stores, one person stated to never buy seed for rice, maize and wheat but regularly for vegetables. Another farmer who entered the store to buy feed supplements for his cows said he would not buy any seed since he is only producing for his own consumption. One man stated that he bought paddy seed from improved OPVs every seven to eight years, but hybrid paddy seed every year. He plants both hybrid and seed from improved OPVs to equal shares in his field for security reasons: *"Because in some years the hybrid may fail, in some years the improved may fail".* One

Figure 6: Paddy seed sourcing frequency of farmers (n= 27) interviewed at five different Agro- vet stores in Bharatpur.

not have any regular purchasing pattern and only to change either the seed or the variety when the productivity declines in his perception. Two people who visited the Agro-Vet store to buy small hand packed bags of vegetable seed which are used in the kitchen gardens stated to never buy seed for cereal crops. One of them explained: *"I am not commercialized I produce for only consumption so I don't want to buy from shops".* He elaborated that he does not see sense in investing money in something that does not return him any profit. Money does not seem to play a restraining role for

most of the farmers. *“In earlier times, there were no such facilities nearby, such as Agro-Vet or cooperative. So we kept our seed in the house. Now, every seed is available in the Agro-Vet and cooperatives so why to store the seed in the house? And in the same way the seed which is stored in the house the production is less, so the good seed we can bring from the Agro-Vet”*. This implies that the traditional system of storing and exchanging is something that has been done out of necessity but is not perceived essential anymore among the interviewed population. As a reason why money does not play a restraining role one lady stated: *‘my sons send money from abroad, so I could start to rear broilers for selling, 300 broilers. My main income is from those animals and the sons abroad’*. She is not the only person who explained his or her ability to purchase new seed so frequently with the remittances he or she receives from abroad. Some have children studying or working in the USA, Australia, Canada or Europe, others have relatives that went for labor to Qatar others have a husband at the Indian army. In yet other farming families, at least one or more persons have a job next to agriculture, such as working in an office or the like.

Vegetables

Vegetable seed is either purchased in small hand- packed bags, in pre-packed aluminum bags of about 20 to 50 gram or lose in larger bags from which the desired amount gets weighed off. The small hand-packed bags contain either seed from open pollinated varieties or seed from landrace varieties. In the prior case this seed is taken from the 20 to 50 gram packages and divided into smaller portions. What is noteworthy here, is that the company name is not displayed on the small hand-packed bags and none of the customers I observed in the different Agro-Vet stores ever asked for a company name. This relates to the earlier presented finding that the individuals that purchase seed do not base their decision making on brand recognition. Vegetable seed that is bought on a regular basis is mostly of different varieties of mustard, radish, carrots, and different varieties of beans, tomato and different gourds. These are vegetables that are consumed on an almost daily basis and constitute a big share of the average diet.



Picture 4: Typical Agro-Vet store with shopkeeper



Picture 5: Hand packed 'local' vegetable seed from landrace varieties

All interviewed persons stated to buy new vegetable seed every year. Some individuals grow a small amount of vegetables additional to what they need for their own supply. This additional production is sold off farm or on local markets. For this purpose, the seed of hybrid varieties is preferred, as the productivity is higher than the one of seed of improved OPVs or landrace varieties. These farmers also stated that since they can make a profit by selling vegetables it is possible for them to buy hybrid seed. Others, who mainly grow vegetables for home consumption prefer those grown from the seed of landrace or improved OPVs for the better taste: *“actually I do not want hybrid seed for [growing] vegetables because [vegetables grown from] hybrid seed is not so tasty like the [ones grown from] local seed”*.

5.4. Changes in seed sourcing

Seed sourcing earlier

Traditionally it was common to store on farm and exchange seed with the neighbors. After agricultural cooperatives had opened in the areas I conducted interviews, people started to make use of those. I was told that the development of the formal seed sector has been taken the following trajectory: until approximately 20 or 30 years ago the seed system was entirely farmer based *“before I used to keep the rice seed that was not broken from my own farm and I used to continue to plant that in another season also but the productivity was not so good because it was produced in my own farm, I stored it myself and later I used to bring seed from the cooperatives”*. This statement is representative of what I heard from many older farmers in their fifties and sixties. They used to select and store seed from their own production in their houses to sow them in the following year and continue this circle year after year. If a fellow villager had better production, one would occasionally exchange some seed or simply ask for seed. The glance on the neighbor’s field in order to assess the quality of his or her crop is something that still happens nowadays. A farmer still inquires with the neighbor about the good quality of his harvest. In earlier days the reaction would have been to request some seed from the well performing one, now this interaction in most cases ends with the one farmer giving the other information on where to purchase the same seed. So what used to be the source for seed has widely turned into being source of information. In the 1950s the first cooperatives in Nepal have been established. Those were credit cooperatives in the Terai with the purpose to provide assistance to flood victims. From here on the development of a cooperative movement in Nepal continued slowly, was organized by the government and to a large part limited to credit and finance. In 1992 the *Cooperative Act* was released which gave farmers the freedom to organize themselves in cooperatives (Poudel, 2007). Parallel to the increasing development of farmer cooperatives (among others, farm supply cooperatives and production cooperatives) the seed system also slowly started to develop in a different direction: according to the farmers I spoke to more and more farmers started to purchase seed from cooperatives instead of continuing with their old system of seed acquisition. *“There were agricultural development cooperatives in that time. These Agro-Vets have just established themselves 6 to 7 years ago so we were used to buy from that agricultural development committee or otherwise general market”*. By ‘agricultural development cooperatives’ the interviewed refers to so-called ‘agricultural multipurpose cooperatives’ which mainly focus on the supply of agricultural inputs (with paddy, wheat, maize and oil seeds being the main commodity)

, providing access to loans and the selling of daily consumer goods (Münkner, Shrestha, 1998). According to the farmers in Jhapa and Chitwan I spoke to, the first Agro-Vet stores have opened approximately ten years ago in their regions and many individuals started to partly shift from saving seed to purchasing seed at those stores. Younger farmers I talked to do not remember the times when it was not possible or common to buy seed at the cooperative or government office.

“We never had the habit of exchanging the seed. Before bringing seed from Anamol we never brought seed from our household or neighborhood but we used to buy the seed from that cooperative from which Rhanyabad [a previously interviewed neighbor] also used to buy before bringing the seed from Anamol”.

The change in seed sourcing behavior is according to many farmers I interviewed ascribed to the process of modernization and the accompanying increased access to information. One person stated: *‘before, there was a lack of education, now people are more educated and also the information technology has been improved recently, TV, radios, it has only been ten years it is available here.’*

Seed sourcing now

In this sub chapter the common seed sources for both vegetable and cereal crops among the interviewed farmers are presented. The decision where to buy seed is largely based on reasons such as trust and habit. Two farmer gave very similar answers to the question why they would buy their seed from the Agro-Vet respectively Cooperative. They were however of opposite opinion:

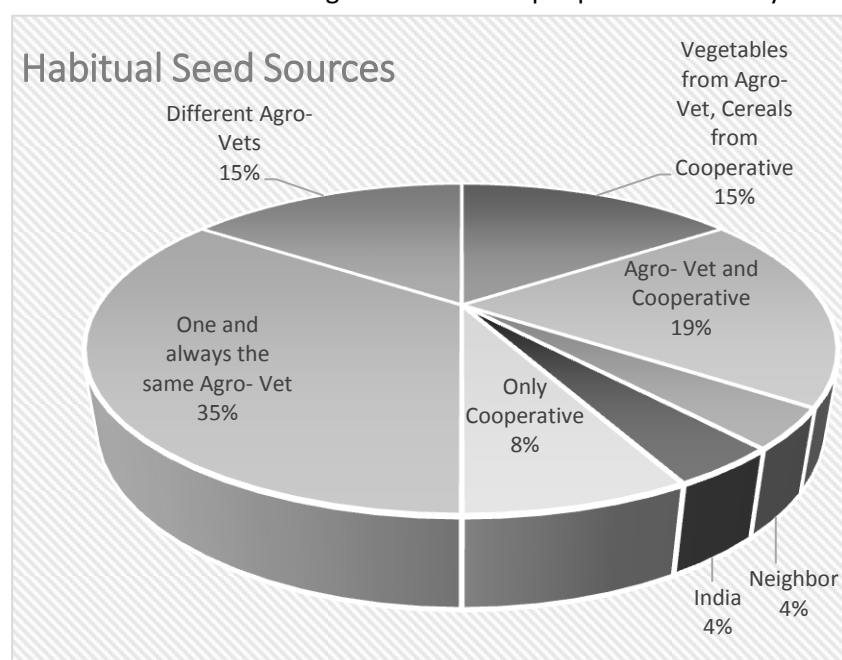
“Because I trust them [cooperatives]. From many years back I was doing transactions from cooperative for the cereals so I do not go to any Agro-Vet for the cereals”

<- and ->

“I prefer Agro-Vet because I trust more upon the Agro-Vet not on the cooperative. Because in the Agro-Vet there will be more trustworthy transaction than in the cooperative”.

These two arguments provide examples for how a feeling like trust is built up and perceived. In both cases this feeling was created as a result of positive experiences. It is for example highly dependent on individual experiences why the second person judges the Agro-Vet to be more trustworthy than a cooperative. Similarly the first person would not make changes in his seed purchasing behavior simply because he knows the cooperative for many years. Such personal relations influence the decision making processes of individual farmers. This pattern can also be noticed in Figure 7. Here it is shown that the highest amount of people stated to buy seed for vegetable and cereal crops at the

same Agro-Vet store all the time, similarly to the first person. One Agro-Vet stated: *“near to 50 to 60% of my consumers come frequently. I have a good feeling about my Agro-Vet [store], many people come and buy and also ask for suggestions”.* Others make a strict distinction between buying vegetable seed at the Agro-Vet store and cereal seed at the cooperative. The reasons here for



vary from a small price difference of one or two Rupees less per kilogram of cereal seed at the cooperative to convenience (*"the cooperative is just nearby my house"*). Only one person claimed to buy seed from the neighbor *"because local tastes better"*. Here again the interviewed refers to a crop grown from seed of a landrace variety by using the term *'local'*. Others stated only to fall back on the neighbor as a seed provider as a sort of emergency option, one farmer explains: *"when I don't get the seed from the cooperative, when the shortage of seed is there, then only I call the neighbors and relatives for seed"*. Another person said: *"I don't want to ask the neighbors to borrow the seed. I know that all the type of seed is available in Agro-Vet, so I come here to buy"*. The second statement clearly shows, that the notion of getting seed from the neighbor is not what anyone would do anymore on a regular basis, but, as the first statement implies, that the community (and therefore the neighbor) is still perceived as providing a certain level of security to the individual. Yet another interviewee stated to buy seed across the Indian boarder which is approximately 100 kilometers far to the south, as it is cheaper there. This approach is one I also saw in Surunga, Jhapa District from where the Indian boarder can easily be reached by public bus for 50 NRS (0.45€) within an hour's drive. Again, money has never been mentioned as a constraining factor. All answers relate to convenience, trust, habit and a quest for the highest productivity.

Where do the neighbors buy?

To confirm a general pattern I also inquired about the seed sources of their neighbors. This helps to estimate whether the seed sourcing behavior of the interviewee is exceptional in his environment and can therefore to a certain extent be considered representative or not. The way in which neighbors of the interviewees source seed have proven to be quite similar amongst the interviewed Agro-Vet customers. The majority of the neighbors are, as perceived by the interviewed, buying their seed from the nearest Agro-Vet store or cooperative to their house. This nearest store is in most cases the same one that the interviewed person also frequently visits. Some do however also drop in the Agro-Vet stores in the city once they are there to do some shopping anyways. One person said: *"among my village neighbors only ten percent store the seed in the house, ten percent only use the seed for next generation but remaining 90 % they visit the Agro-Vet and buy the new seed"*. This representation is also reflected in the fact that 6 persons told me they would not know anyone in their circle of acquaintances that does not buy seed at least every second year. Others said: *"no, there is no such farmer who uses the seed from storing in his house"* and *"maximum people don't want to store in the house and they usually buy the seed from the Agro-Vet"*. One farmer made the attempt to explain what the reasons of those who do not buy seed may be: *"those people are not poor, they are rich people but they don't want to change their old traditions. They don't want to buy the seed from Agro-Vet. They want to stick to the traditional method of paddy growing. They only look for the taste, they don't want to produce any more for the market, I think they are these kind of people"*. In this statement, again money is not perceived as a restraining factor amongst the interviewed population. Only one person stated that he was not aware of the place where his neighbors obtain their seed from, but still he knew *"that the people only want to buy the improved seed and get the improved seed"*. As noted before, money has not been mentioned once as a restraining or enabling factor or even mentioned at all.

Additionally there is the strong belief in every single farmer I talked to that it is of utmost importance to change or rotate as many components as possible on their farm in order to prevent the depletion of their soils. One of the farmers stated: *'in every training they tell us to change the seed, change the crop, change everything in every year or the production will be less!'* I heard similar reasoning in the majority of the interviews I conducted. It is interesting, that this information got absorbed and incorporated on such a deep level. This might be connected to the threat that the productivity will decline if no changes are performed. The higher productivity of a crop has been the main reason for starting, respectively continuing to work with Anamolbiu Pvt. Ltd. as well as the almost only request brought across to the retailer when acquiring seed :*'I ask for the productive seed only!'*

5.4. Synopsis

This chapter has shown the properties of the seed purchasing process of the interviewed population and the factors that do influence this process. One result presented above is that seed from open pollinated varieties, so the seed Anamolbiu Pvt. Ltd. produces majoritarian, is purchased by farmers who use the produce for mainly home consumption and in case of surplus production sell on the local market or within their own communities. The overall implication is that farmers who buy seed at the retailer do prefer to approach the same one regularly out of trust and convenience. Concerning vegetable seed, they are not aware of or interested in which company they purchase and trust the suggestions of their retailer. In cereal seeds, every farmer is absolutely aware of which variety he or she grows for which reasons, but again does not pay attention to any specific company when purchasing. Hardly anyone stated to acquire seed from their neighbors, but it is however kept in mind as a possibility, as a sort of security net. This implies that the seed sourcing strategies have changed, but not the underlying networks that constituted them- only the use of those networks has been adapted. Further, the findings imply, that money does not play a role in the process of deciding how often to purchase seed, quality and productivity does. Therefore, the findings of this chapter imply, that Anamolbiu Pvt. Ltd.'s seed is bought by farmers with average economic status, augmented by income through off- farm activities of one or more family members, or remittances from abroad.

CHAPTER 6- CUSTOMER, AGRO-VET AND COMPANY

6.1. Customer and Agro-Vet

When asking the farmers who came to buy seed (paddy and vegetables) in the Agro-Vet stores in Narayangarh and whether they knew which brand they were buying, most of them either answered they would not know or turned towards the shop keeper to ask him which brand they were buying. In one case the Agro-Vet interjected: *“he doesn’t pay much attention to what kind of seed he uses. Next year he can forget which seed it was. He asks which is good and he will buy what I tell him”*. This statement shows how much trust the customer places in the Agro-Vet and also how aware the Agro-Vet is of his position. Another Agro-Vet said: *“most of the farmers don’t even know what they are buying, once it is in a package they think it is hybrid”*. Farmers seem to know little about the seed they buy. It also came back within the interviews that they do not care much. The only thing which was important to every single farmer was ‘good productivity’. For paddy every single interviewee was able to tell me the exact variety he or she uses and had used prior to the current one. Many customers used the word ‘trust’ while explaining why they make use of that certain Agro-Vet on a frequent basis. Many people do not only buy seed at the Agro-Vet store but also come there to get advice on their pest and disease management and livestock keeping. I witnessed an example of a tall and well-dressed man arrives with a branch of a chili plant in his hand. The plant had stains on its leaves and is slightly discolored. While waiting until the shopkeeper had time for him he already engaged into discussions about his plant with another waiting customer. Also my translator got involved. She explained me that the man is a commercial chili farmer on 5 Kattha (1 690 m²) of land. Big parts of his entire production were affected by the same problem as the sample plant he brought. The Agro-Vet as well as all others involved in the discussion about what could be the cause of the plant’s disease were not entirely sure what the problem was. Instead of sending the farmer to another place for further advice, the Agro-Vet took the farmer and his chili plant on the back of his motorbike in order to seek extra recommendations from his brother who is an agriculturalist. This scene makes one better understand the relation between Agro-Vet and customer. The customer can be sure that the Agro-Vet store keeper does everything that is in his power to help him solving his problem. One farmer who witnessed the scene together with me said:

“We trust upon the Agro-Vet so we buy all types of seed from there. So [we buy] cereals [seed] and vegetable seed also. So in [case we have problems with] pest and diseases or any type of problem regarding the agricultural operation we obviously visit the Agro-Vet”.

Another man told me about the paddy variety he was currently using and satisfied about: *"I bought the seed from Chenauli Agro-Vet, he advised me well, I trust always upon the Agro-Vet"*. Those examples all feature individuals that had a good experience and therefore continued to go to the same place as source for agricultural input and advice. *"Because this Agro-Vet provides the new seed and I believe this Agro-Vet also gives good seed"*. Others claimed to trust their Agro-Vet because *"he is nearby my house"*, which implies that the customer knows the Agro-Vet for a long period of time, they are part of the same community and therefore perceived as a person to be trusted. These examples show that the decision of where to source seed was largely based on social informal relations rather than the actual product characteristics. Which was however also a topic of importance to the customer but not evaluated by the use of own knowledge but by use of the knowledge of a person they trust, typically the Agro-Vet. In other cases this person has shown to be the neighbor who has a beautiful healthy crop standing on the field and is asked for advice on where to get the seed for that crop or how to generate a similar outcome.

Marketing activities of seed companies that are active in Nepal seem to be mainly directed at retailers. There are hardly any posters or other advertisements aiming at farmers who buy seed. As long as the retailer has the trust of the customer, he can advise them any kind of product and the advice will be taken on without any doubt. The Agro-Vet store is not only an agricultural supply store. It is a place where people meet, interact, and exchange stories and advice about their farming and the latest products on the market. After spending several days at different Agro-Vet stores this was the overall impression I had. The stores are frequented by walk-in customers, regular customers and retailers from more remote areas. The majority of persons that pass by took the time to chat to the shop keeper and other customers, some took tea together – served by the employees of the Agro-Vet owner or one of the many local restaurants around. In any case always on the cost of the Agro-Vet- while they were waiting to be attended, others waited for their wives to finish the rest of the shopping and so on. Everyone was smiling at each other, very friendly and obliging. Some appeared richer than others: they were fat, wore golden jewelry, seemed to be confident and were dressed in western, modern clothes. Others came with traditional hats, rather old and worn-out clothes, dusty from their journey from the village. Sitting there with them I could get a good insight in the Agro-Vet-consumer interactions. Most of the customers took about 20 to 30 minutes to round off their actual purchase. They took their time to look at different packages, asked some questions about price and quality, asked for *'productive seed'* and listened to the advice of the Agro-Vet. *"Yes, all the time I take the seed from here and apart from this I ask also if it costs a bit more will the quality be better then? Give me productive and germinative seed. A year back I took some advice for potato"*. At times other customers would interfere, either with additional advice or additional questions on the same matter.

Next to the Agro-Vet, people had additional sources for advice and information. One person stated: *"Most of the time I visit this Agro-Vet for advice because he is specialist and from time to time I have visited that DADO office and sometimes the agricultural university"*. This person was a special case however among the interviewees since he worked at the DADO office and thereby had a direct and personal link to people who have an academic background in agriculture. Two more persons also stated to seek advice at the DADO office located in approximately two kilometers distance of the center of Narayanganr since they lived close to it. Two other persons told me they got advice and information mainly from relatives and neighbors during casual conversations after having taken a look at their fields. This refers to the earlier observation (see Chapter 5.4.), that, what used to be source of seed in earlier times is now transformed to become source of information. Only one person stated to get information from the radio. Others specified more: for cereal crops they take advice from the cooperative (as those individuals also acquired their seed for cereal crops at cooperatives), for vegetable crops and problems with livestock at the Agro-Vet store. The previous sub chapter

showed, that many farmers continue to visit the same Agro-Vet store on a regular basis for their seed purchases. This ascribe the shop keeper a role that is way bigger than simply providing products to the customer. He is somewhat the advice giver, the crucial link between company and consumer.

The story of the farmer with the chili plant allows to understand on what basis the trust almost every farmer places in the Agro-Vet or Cooperative he visits is built. He is a frequent customer of the Agro-Vet store and has a well-established social relation to the shop keeper. Alike him, many of the customers pass by the store for years already. If they do not make a purchase, they stop for a tea or a chat. Through these ongoing interactions the Agro-Vet store keeper becomes more than just a shop keeper, he becomes part of the customer's social environment. This places him on a similar level relationship as a neighbor or friend, without actually being a part of the community the customer lives in. One Agro-Vet store I visited was located in a more rural area where the store keeper was indeed part of the community. His customers are predominantly neighbors and friends. The behavior pattern I observed between Agro-Vet and customer appeared similar to the behavior pattern within the communities of the contract growers and COB participants. Within these communities I encountered a rather strong social cohesion (see Chapter 4.3).

6.2. Agro-Vet and company

The interests of the company

The interactions between retailer and company take course in a rather informal way. The initial contact is established by the company. When a new Agro-Vet store opens, normally various companies selling agricultural supply visit the shop keepers, inform them about their stock and make an offer. In most shops, they sell seeds of various companies, usually seed of various varieties per crop, of more than one company. The wife of one Agro-Vet told me: *"those people [companies] came here and convinced us a lot so that we are getting into a business relation and we are keeping [selling] their product."* Also another Agro-Vet used the term 'to convince' when he explained how the contact between a seed company and a retailer gets established. This indicates, that whether a business relation is developed is highly dependent on the retailer. After the business relation has been established, the contact remains widely personal and informal. To give an example: the head of the marketing department of Anamolbiu Pvt. Ltd. visited all Agro-Vets and cooperatives the company does transactions with on a regular basis in order to collect the company's income from them. Those visits were also used to have a cup of tea together and discuss all sorts of private issues such as family matters. At this occasion the company representative also asked how the product was selling or offers incentives to the Agro-Vet. *"In 5 times [they are visiting], 2 times [they are] asking 'how do you like our product, how is it selling?' And 3 times [they are] bringing seed, asking '[do] you want this or not?'"* Many Agro-Vet stores did not have long term contracts with specific companies. Every season seed companies visiting Agro-Vet stores and cooperatives of their interest and offer their product to them. One Agro-Vet store keeper pointed out:

“According to my wish I buy from them. When I don’t like this company I will leave it. So, such type of [long term] agreement we don’t have with [a] specific company. Other Agro-Vets may have. Nepali companies make agreements and have schemes like if you target 10 Lakhs you will get scheme”.

So, if a retailer manages to make a turnover of one million Nepalese Rupees being equivalent to about 9 500 Euro of one seed company this company offers him a bonus scheme. This bonus scheme then allows the retailer to lower his purchasing costs and thereby increase his profit margin. Foreign companies who deal with vegetable seed of hybrid varieties offer incentives such as trips to Malaysia or Thailand when a certain sales volume is met. This is to encourage the Agro-Vet store to primarily promote their product. The demands for hybrid vegetable seed is however not large enough for many Agro-Vets to reach the sales volume needed to benefit from the incentives. Nepalese companies (in vegetable as well as cereal crop seed) compete by price competition or offering discounts to the retailers. The combination of the high degree of trust the consumers place in the Agro-Vet stores and the dependence of the companies on them to reach the consumers puts the Agro-Vet store in a central place in the seed supply chain where he has to negotiate various interests.

It is now interesting to understand on which basis the Agro-Vet makes his decision on what to sell to the customer. Each of the interviewed stated to first recommend the seed of the company he personally is most involved with. One Agro-Vet ran his own seed enterprise next to the shop. Therefore the first seed he recommended was the one from his own company. After the stock of his own seed was finished he would move on to selling the seed of another company. In his case this is Anamolbiu Pvt. Ltd.

“Because I have a good relation with Anamol that is why I sell more seed of Anamol”. After this he would look into the profit margin he could reach from selling a company’s seeds. “At first I want to give my own production, if there is. Actually I first sell my production and besides my production the remaining seed I use to sell from Anamol or from other seed company which I have in stock”.

Another Agro-Vet told me:

“Actually what I do is business transaction more with Anamol products because me myself I’m a shareholder so obviously first I want to give the Anamol product. If there is no seed from Anamol available, if I do not have product of Anamol, then only I give seed from alternative company.”

So in both these cases when a customer asked for ‘good seed’, the Agro-Vet did provide him with his own seed or the one from Anamolbiu Pvt. Ltd. because he as the shop keeper had a personal advantage from it. Another more practical approach is that the seed which is still in stock from the previous season is sold first in order to avoid spoilage. Generally all five interviewed Agro-Vets stated to sell from the company which offers them the highest profit margin, which means, the company that sells their seed to the lowest price and thereby allows the Agro-Vet to put a higher premium on it. Two Agro-Vets indicated that the profit margin is also flexible concerning customer type. One Agro-Vet adds up to 50% of the wholesale price for an individual small scale farmer but only 15 to 20% for a large scale farmer or another retailer. A second Agro-Vet had less extreme differences of only adding 15 to 20% for individual farmers and 10% for retailers. In monetary value this accounts to 2 to 5 NRS (0,02 respectively 0,04 Euro cent) per kilogram of paddy seed.

Apart from the above mentioned factors, the Agro-Vets also look for the germination percentage of a variety, which is written on the package label. One shop keeper explained:

“I look upon the germination percentage of all varieties, because if I sell the product, in a small kitchen garden there will nothing happen, no loss [if the germination is bad]. But for the commercial

[vegetable] farmers they have to wait for the right season and if they took this seed to their house and they sow the seed and it does not germinate then large commercial farmers have the loss for them. Because they are waiting for the season to start growing and invest in their fields as a business. So they depend more on quality seed with a high germination percentage. They come upon me and quarrel if the germination percentage is low, so it is risky for me”.

This statement again implies that the Agro-Vet is well aware of how he is perceived by his customers and also that he knows his customers and their needs thoroughly. One Agro-Vet I talked to summed this entire process up very well in a few words:

“There is not any specific quality [difference in paddy and vegetable seed from different companies], because all are the same quality but the conversation , the relation to the farmer, the farmer to cooperative, farmer to government organization, farmer to Agro-Vet: this relation makes the difference. Only the relation maintains the company”.

This statement tellingly summarizes the huge role that informal inter-human relations do play in business interactions in the seed sector of Nepal and how crucial the retailer is in the seed supply chain.

The mixture of interpersonal interaction and material incentives between seed companies and retailers is what the interviewed Agro-vets referred to as marketing. Both components are perceived as equally important. So, I was for example told that the marketing of Anamolbiu Pvt. Ltd. has not been as good compared to other companies this year since:

“For example other companies visit 5 times during the season, Anamol visits once. In each visit they won’t ask us how their product is, how are you selling our product. They just visit, they bring their product in the bag - just like that. Others visit 5 times. So we took a small-small amount of Anamol this year”.

This statement implies how important the personal interaction is perceived to be by this Agro-Vet. It is based on an informal code of conduct in which the interpersonal interaction is based on a set of unwritten rules defining polite and appropriate behavior.

6.3. Synopsis

The previous two sub-chapters presented the consumer part of Anamolbiu Pvt. Ltd.’s supply system. They showed that seed buyers do not make their purchase choice based on brand recognition, but either on quality or variety (in cereal crops), therefore experience. The judgement of what product is of high quality is left to the retailer. This decision is grounded in trust in his abilities. Money seems not to play a great role in the decision making process either, which indicates that the level of society the interviewed farmers belong to is one of increasing wealth. In this case to a high extent based on remittances from outside the country and off-farm income. Many farmers also continue to visit the same Agro-Vet store on a regular basis for their seed purchases. This ascribes the shop keeper a role that is way bigger than simply providing products to the customer. He is somewhat the advice giver,

the crucial link between company and consumer. The relation between customer and Agro-Vet is given distinction by the immense degree of trust that the customer places in the Agro-Vet. This trust is an emotion the shopkeeper is well aware of and does foster as well as strategically use in his sales activities. Also the relationship between company and retailer is one that takes place on a very personal level by at the same time being of formal, business nature.

CHAPTER 7- DISCUSSION AND CONCLUSION

The previous chapters presented the findings of my field work and aimed to provide an insight on the factors within the social environment and internal set up of the Nepalese seed company Anamolbiu Pvt. Ltd and the properties of their interactions. Within this case I identified different actors: Anamolbiu Pvt. Ltd. as a company and retailers of agricultural input supplies as formal seed system actors and farmers as informal seed system actors. Farmer-company interactions happen at different places within the company's supply system: Breeding and variety selection, seed multiplication activities and the selling of seeds. To gain understanding on the properties of these interactions I applied a system thinking perspective:

Anamolbiu Pvt. Ltd. can be perceived as an open system with various sub-systems constituting it: supply system, formal seed system, informal seed system, farmer communities and the company's external network, including customers. All these sub-systems are again constituted by their own sub-systems. Within Anamolbiu Pvt. Ltd. as the overarching system, all those sub-systems, the elements, are connected to each other through various linkages. These linkages are of mainly two different kinds, which might as well be intertwined: business relations and social relations. In this study I focused at exactly those linkages between the different elements, looking at the following aspects: (1) the features of the set-up of Anamolbiu Pvt. Ltd, (2) the individuals that interact with the formal seed supply system on seed producer and seed 'consumer' side and finally (3) what social arrangements are in place and how they are used or modified.

The findings are now discussed according to the three aspects mentioned above and finally integrated to form a coherent picture of the company's setup and factors influencing its' ability to sustain itself on the market.

7.1. Balancing business concerns and social responsibility

At the beginning of this thesis, I introduced Anamolbiu Pvt. Ltd. as a company and the farmer communities it interacts with. My findings show that Anamolbiu Pvt. Ltd. found a way to attain a balance between catering for the ideal of social responsibility and being a competitive player on the seed market. Anamolbiu Pvt. Ltd. states that the company acts socially responsible by investing in innovations which contribute to the wellbeing of the Nepalese society and by an '*equitable distribution of benefits along the value chain*'. The company operationalizes its belief by empowering

the primary producers through the transfer of knowledge, giving them the access to resources and providing assistance if necessary and/ or requested by the farmers. It includes farmers in its breeding and variety selection activities, to incorporate and conserve knowledge inherent to the informal seed system and contribute to maintaining agrobiodiversity. Anamolbiu Pvt. Ltd. also engages into research on beta-carotene rich tomato varieties with the aim to contribute to food and nutritional security within the country. One farmer who was part of the COB program of Anamolbiu Pvt. Ltd. who was involved in the breeding and variety selection process utilized his knowledge acquired through the collaboration with Anamolbiu Pvt. Ltd. to start experimenting with the development of his own paddy varieties. Others stated that they utilized what they learned from Anamolbiu Pvt. Ltd. (timely transplanting of paddy seedlings, identification of off-types in the field, etc.), using quality seed in their own agricultural activities. Farmers who worked as contract growers were able to increase their income up to 50 percent by producing and selling seed to Anamolbiu Pvt. Ltd. instead of grain to the local market by cultivating an equally sized area. All the farmers were satisfied with the quality and productivity of the seed.

While Anamolbiu Pvt. Ltd. has social responsibility high in its mission statement, it is able to combine it with business success. The success as an enterprise is explained by mainly two factors: firstly, being well connected to other actors in the seed sector and secondly, that Anamolbiu Pvt. Ltd.'s seed is readily purchased. Some of the factors that facilitate Anamolbiu Pvt. Ltd.'s success are:

- the close link with LI- BIRD (see chapter 3)
- the existence of a policy aiming on the improvement of the national seed sector and the accompanying license for breeder seed production (see chapter 2) and
- the interest and engagement of the involved farmers (see chapter 4)

The close link to the Nepalese NGO LI-BIRD appears to be one quite important enabling factor for Anamolbiu Pvt. Ltd. since it simplified the company's product development (improved varieties, seeds) and market entry. Since Anamolbiu Pvt. Ltd. was founded as a result of a 'Research-into-use' (RIU) project, LI-BIRD has been part of, the groundwork was already done by the NGO: the farmers who participated in LI-BIRD's Participatory Plant Breeding (PPB) activities continued to be part of the COB activities or started to work as contract growers for Anamolbiu Pvt. Ltd.. The CEO of the company has a leading function within the NGO as well are many LI-BIRD staff members involved in for example monitoring and research activities of the company. In various African countries for example, newly established national seed companies had difficulties in *'finding and retaining good staff and of getting source seed'* (Van Mele et al., 2011, p. 19). Anamolbiu Pvt.Ltd. did not need to face this problem.

The above mentioned factors I identified as facilitating Anamolbiu Pvt. Ltd.'s success in catering both market and societal needs are found back in three of nine key requirements for the successful development of a seed enterprise indicated in a publication of the FAO: (I) conducive policy environment, (II) availability of improved seed and source seed, (III) linkages between formal and informal seed sectors (Neate and Guéi, 2010). Additionally, Anamolbiu Pvt. Ltd. realizes the need of being able to compete with multinational players on the Nepalese seed market and therefore also engages in solely business oriented activities without farmer participation (development and multiplication of seed of hybrid tomato lines) which are used as a basis to explore opportunities to expand across the nation's borders.

7.2. Who buys the seed and why?

At the end of Anamolbiu Pvt. Ltd.'s supply chain stand people who come from a '*resource endowed*' part of society. The term '*resource endowed*' is borrowed from Rana et al. who define it as follows: '*Research endowed households are highly correlated with larger land areas, higher number of food sufficient months, higher numbers of livestock and amount of off-farm input*' (Rana et al. 2011, p. 260). Money was never mentioned as a constraining factor when asked about the decision to purchase seed. Almost all interviewed farmers said they had sufficient off-farm income in order to pay for seed. This income originates from remittances from family members abroad, side jobs of family members or the selling of agricultural produce on the market. The majority of the interviewed farmers stated that they frequently purchase seed for both vegetables and cereals from formal sources. This contrasts with the overall seed replacement rate for rice in Nepal of around 9 percent (Paudel et al., 2013) and a seed replacement for rice acquired from the formal system at only 1 percent (Baniya et al., 2000). If the interviewed sample of farmers would be representative for entire Nepal, the seed replacement rate would be somewhere around 80 percent. It was however also reported for other parts of the Terai region that '*farmers replace their seed lot quite rapidly (83%)*' (Rana et al., 2011, p. 267) although in these cases only partly from formal sources. This suggests, that a frequent replacement of seed is something that is a quite general practice in several places within Nepal. Amongst the sample of farmers I interviewed seed is acquired from formal sources, which showed to be related to the availability of financial resources (see Chapter 5). The entire seed demand of Nepal is only to an extent of approximately 10 percent served by formal sources (Joshi et al., 2012). Also in other parts of the world, the main seed source for small scale farmers is the informal seed system as in farm-saved seed and seed sourced from neighbors or relatives (GIZ, 2014). In some African countries however, it was found that farmers purchased all of their seed frequently. Here this behavior was correlated with the inability to save seed because of poverty (Tripp and Rohrbach, 2001) which can be excluded as a reason in the present case study. However, in the context of the steadily increasing number of migrants and the correlated rise in remittances (Labor Migration Report 2013/2014), it may be an increased availability of cash that facilitates farmers' willingness or ability to invest in seed sourcing. This might constitute the beginning of a process of change in seed sourcing behavior among a certain group within the Nepalese society (which is farmers from rural areas that are in proximity of towns and cities and connected by a fair infrastructure). This however has to be researched further and quantified.

As motivation to make use of formal seed sources (for rice and vegetable varieties), the farmers gave reasons related to convenience, trust, habit and a quest for the highest productivity. Farmers believe the seed that can be acquired at the Agro-Vet store is of higher quality in terms of germination percentage and purity than seed acquired from the neighbor. Also accessibility and convenience were stated as reasons to buy seed from a retailer. Tripp (2006) employs four categories that drive seed demand: emergency, poverty, seed quality and variety change. He elaborates, that the category

'seed quality' is usually found in '*relatively stable, often commercial, crop production systems in which fresh seed is acquired frequently*' (Tripp, 2006, p.6), which according to Tripp (2006) usually happens in an environment where farmers are more market oriented in their production. The results of my interviews showed that some of the farmers who bought seed frequently sold parts of their harvest or other agricultural products such as milk and therefore have access to financial resources. The remaining farmers stated to have off-farm income from either side jobs or remittances from outside the country. Since the frequent inflow of money allows the farmer to regularly acquire new seed and other agricultural inputs, the production is quite stable. The farmers claimed that their main requirement for a seed is for it to be '*good seed*' with the effect of high productivity, so seed of good quality. Therefore, the reasoning of the interviewed farmers fit the second to last category, seed quality. Following up on Tripp (2006), this means, that those farmers belong to a stratum that is rather commercially oriented. My findings indicate, that the factor that puts the interviewed farmers in this category is their access to financial resources.

7.3. The role of social networks

Synthesizing, my findings indicate that what used to be source for seed starts to turn into being source for information. This finding is explained by the dense social networks formed by the farming communities. People interact with each other on a daily basis, share experiences and opinions about agricultural inputs and production (see chapter 4.3) . A general notion of taking care of each other prevailed in all communities. The findings derived from the interviews with the farmers that interact with Anamolbiu Pvt. Ltd. as contract growers and the COB participants, point to strong social cohesion within their communities. This strong social cohesion influenced the flow of information within the farmer communities. Many farmers stated that they want the entire community to benefit from positive developments. Farmers referred to this as a reason to share knowledge on agricultural production techniques. Farmers who were satisfied with their work relationship with Anamolbiu Pvt. Ltd. and its products (more harvest, stable income, etc.) made an effort to inform and convince their fellow villagers to get engaged with Anamolbiu Pvt. Ltd. as well.

In each producer community I could identify at least one farmer setting himself apart by being a bit more open to new developments and with a higher interest in acquiring new knowledge than other community members. Those individuals served as nodal points from which the dissemination of knowledge and information relating to agricultural production techniques started within the communities. In a study on maintaining crop diversity in Nepal, networks of seed flow featuring '*nodal farmers*' have been identified as well (Subedi et al., 2003). Here those farmers were identified as potentially playing a key role in maintaining agrobiodiversity (Subedi et al., 2003) by facilitating seed flows. My findings suggest that similarly built networks are in place, but it is information (for example on where to buy '*good seed*') that is passed through rather than actual seed, meaning that the nodal farmers for seed become nodal farmers for information.

Regarding Granovetter's theory on social networks, these nodal farmers constitute the '*structural holes*' in the social network of their communities. This means they are individuals which have linkages (weak ties) to individuals outside their own network. From those individuals outside they gather information which they insert into their own network. This information is then passed on within the cohesive network via linkages (strong ties) between the individuals that are part of it. In the present case, the external information is obtained from Anamolbiu Pvt. Ltd. and concerns the possibility to improve one's livelihood through adopting one's farming practices. The information

that is passed on though this network is hardly evaluated by the farmer who receives it. In Chapter 5, I gave the example of one farmer who is by his fellow villagers perceived as a person who is knowledgeable in the field of agricultural production. This seems to be enough of a reason to adopt his techniques. This process of adopting a practice because or if others are doing so is called conformist bias (Henrich, 2001) and part of a social learning process. The described process can also be understood as an occurrence of agricultural de-skilling, which is defined as the disruption of the balance between social and environmental learning. Briefly said, the balance between decisions that are made on the basis of own evaluations and decisions that are made on the basis of what other actors in the environment of a farmer do. Stone (2007) observed a similar situation in India in the context of farmers rapidly adopting seed of a genetically engineered cotton variety: farmers basically mimic the behaviour of (some of) their fellow farmers without further evaluation. In Stone's (2007) case the farmers did so because of the high frequency with which new varieties entered the market, so that there was simply no time to learn about their properties and performance and thereby evaluate decisions themselves. He mentions that farmers seemed to have little precise knowledge on the traits of the seed they use apart from that it gives '*good yield*' (Stone, 2007,p.78). The farmers I interviewed in the Agro-Vet stores on their seed purchasing decisions also stated that they only ask for '*good seed*'. This similarity in defining the properties of a crop variety by one very basic, almost superficial and somewhat intangible factor indicates that a certain level of agricultural de-skilling occurred. The farmer does not know what else he wants from a seed, what actually are the attributes that make a seed become '*good*', the act of determining that is left to a trusted individual. In the present case the above mentioned nodal farmers or the retailer from which seed is purchased. I also identified the presence and influence of an interpersonal factor between customer and retailer: a large amount of trust is placed in the retailer to recommend the best possible product. This trust is usually built up by making continuous positive experiences over a certain period of time. It is therefore essential for Anamolbiu Pvt. Ltd. to either continue investing in a positive relation to its retailers or to try to shift the trust the customer places in the retailer towards the company as an institution.

The findings derived from observations and interviews with farmers who are customers of Agro-vet stores suggest that the main factor influencing from which company a farmer buys seed, is the retailer. The customers frequently said to trust the retailer that he will provide them with proper advice. This trust is based on positive experiences with the same retailer in the past. The customers I interviewed left the decision of which seed to buy to the retailer, which means that they did not evaluate themselves on why this seed might be good or not, but left this to the retailer. Also between company and retailer interpersonal relations played a significant role in determining from which company the customers finally purchased seed. Here the relations were based on a sort of informal conduct. The retailers stated to primarily advice the farmers to buy seed of a company the retailer has a good relationship with. That a good connection between the middleman and the supplier plays an important role in determining the success of a business relationship was also found in the context of other agricultural supply chains(Bebbington, 2000). Also in Ecuador, middlemen were identified to be key players in the marketing system and influencing prices and sales (Smith, 1975). This stands opposed to a classical and neo-classical economy in which the absence of social relation is seen as a basis for a functional, thus competitive market (Granovetter, 1985).

7.4. Conclusion

Various studies suggest that setting up and maintaining a seed enterprise in a developing country is difficult. The results of those studies show basically two hindering factors: 1) there is not enough demand for seed of improved varieties from farmers' side and/ or 2) there is no or not enough seed of improved varieties available.

My results paint a picture of a case in which setting up a seed enterprise in a developing country appears to have worked. It is however still a young initiative and does not produce net profit yet appears that Anamolbiu Pvt. Ltd. finds itself in a position in which both hindering factors mentioned above are not applying. Anamolbiu Pvt. Ltd.'s seed of improved varieties is (alike the one from other seed companies) readily purchased by farmers. These farmers stem from households that are largely sustained through remittances from family members working and studying in all parts of the world. Many of these households would otherwise be quite resource constraint and would not have access to seed of improved varieties.

This availability of resources and demand for seed of improved varieties combined with the occurrence of a certain degree of agricultural de-skilling among the farmers puts Anamolbiu Pvt. Ltd in a favorable position. The customers are willing and able to purchase seed of improved varieties but do not entirely evaluate their purchase themselves but leave that largely to the retailer. Therefore Anamolbiu Pvt. Ltd. does not have to target and convince a huge population to buy their product, but 'only' needs to properly maintain their relation to the retailers: informal social relations play a big role in determining which seed of which company finally gets sold.

What further contributed to Anamolbiu Pvt. Ltd.'s successful development up to the current point in time was a set-up of informal social relations between the different actors. The link to the NGO LI-BIRD simplified Anamolbiu Pvt. Ltd.'s market entry as it provided the company with the access to varieties and source seed, and experienced staff as well as with connections to contract growers and COB participants. The fact that the company was 'born' into an already established network of partners on the input and production side appeared to be one factor that facilitated its' smooth and steady development. Especially in countries in which formal interactions between different parties are based and/or shaped by informal social interactions and conducts, the approach of acknowledging the existence of such already established networks and their conscious can contribute to the successful development of national seed (and other) businesses.

All in all my results indicate that setting up a seed enterprise in a developing country can work in a way that it is economically viable and at the same time caters to the ideal of social responsibility. My results however also confirm what has been found before, that this was basically only possible

because there was a secured demand for seed of improved varieties which was facilitated by the availability of financial resources. Existing networks and informal relations, when recognized and understood can facilitate the positive development of a seed business in a developing country but without sufficient demand and resources on the farmers' side setting up a sustainable seed business remains a challenge.

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9. ANNEX

9.1. Details of interviews with farmers

Table A1: Interviewing scheme contract growers in Chitwan and Nawalparasi

PLACE	NUMBER OF INTERVIEWEES
Gaurigunj, Chitwan	4
Prembasti, Chitwan	2
Parsa, Chitwan	2
Arun Khola, Nawalparasi	2

Table A2 : Interviewing scheme, COB participants in Jhapa

PLACE	NUMBER OF INTERVIEWEES
Durgapur, Jhapa	6
Surunga west, Jhapa	4
Surunga south, Jhapa	4

9.2. List of contract growers of Anamolbiu Pvt. Ltd. per district and crop

SN	District	Crops	No of Contract
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			Growers
1	Doti	Radish, Peas, Spinach, Rayo, Beans, Cauliflower, Broccoli & Cress	77
2	Kaski	Cow pea & Beans	20
3	Tanahun	Cow pea	58
4	Jumla	Carrot & Radish(Tokinase)	25
5	Chitwan	Beans	57
6	Surkhet	Peas, Cauliflower, Rayo, Onion, Broad beans, Okra, Sponge gourd, Snake gourd & Bitter gourd	59
7	Chitwan	Rice, Wheat, Maize & Potato	125
8	Nawalparasi	Rice, wheat, lentil	160

9.3. List of COB farmers per district and crop

SN	District	Crops	No of farmers involved
1	Jhapa	COB rice	20
2	Jhapa	Rice Seed multiplication (COB varieties)	39
3	Chitwan	Rice Seed multiplication (COB varieties)	3
4	Nawalparasi	Rice Seed multiplication (COB varieties)	5

9.4. List of cooperatives and Agro-Vets selling Anamolbiu Pvt. Ltd. seed per district

SN	District	Cooperative/Agro-vets	Number supplied with Anamolbiu seeds
1	Doti	Cooperative/Agrovet	1/1
2	Kailali	Agrovet	3
3	Banke	Agrovet	3
4	Surkhet	Agrovet	4
5	Jajarkot	Cooperative	1
6	Dang	Agrovet	3
7	Pyuthan	Agrovet	1
8	Rupandahi	Agrovet	2
9	Nawalparasi	Cooperative/Agrovet	2/4
10	Chitwan	Cooperative/Agrovet	6/17
11	Palpa	Agrovet	1
12	Kaski	Agrovet	2
13	Parvat	Cooperative/Agrovet	1/1
14	Baglung	Agrovet	3

15	Myagdi	Agrovet	1
16	Tanahun	Agrovet	1/2
17	Lamjung	Agrovet	2
18	Gorkha	Agrovet	1
19	Dhading	Agrovet	3
20	Kathmandu	Agrovet	2
21	Lalitpur	Agrovet	1
22	Kavre	Agrovet	3
23	Makawanpur	Agrovet	1/3
24	Bara	Agrovet	12
25	Parsa	Agrovet	3
26	Rautahat	Agrovet	4
27	Siraha	Agrovet	4
28	Sarlahi	Agrovet	4
29	Mahottari	Agrovet	1
30	Dhanusa	Agrovet	3
31	Morang	Agrovet	2
32	Sunsari	Agrovet	2
33	Jhapa	Cooperative/Agrovet	1/6
34	Sindhuli	Agrovet	1
35	Dadeldhura	Cooperative	1