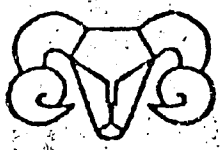

Small Ruminant - CRSP

THE DEVELOPMENT OF AN ANIMAL HEALTH DELIVERY NETWORK IN NORTH SUMATRA
Report of Phase 1

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Artaria Misniwaty and Meruwald Doloksaribu

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SUB-BALAI PENELITIAN TERNAK, SUNGAI PUTIH

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THE DEVELOPMENT OF AN ANIMAL HEALTH DELIVERY NETWORK IN NORTH SUMATRA[1]
Report of Phase 1

Ton van Schie[2], Joost Verwilghen[2],
Artaria Misniwaty[3] and Meruwald Doloksaribu[3]

ABSTRACT

The delivery of animal health care supplies in the rural areas of North Sumatra is not yet developed. The objective of this project is to develop such an animal health delivery network for sheep. A survey was conducted in Kecamatan Galang, Deli Serdang, North Sumatra from March to May 1992. Twenty-six farmers of the ORP project, twenty non-ORP farmers, staff of the government livestock service, livestock traders, wholesale dealers and owners of poultry shops were interviewed. The results showed that the sheep and goats population in Deli Serdang has increased during the last four years. The average flock size of ORP farmers (who receive extension from SR-CRSP) is slightly bigger than the flock size of non-ORP farmers (who receive extension from the government livestock service). Farmers seem to lack information about the use of anthelmintics. This is mainly because sheep farming is only a minor component in the farming system of these smallholder farmers. Traders play an important role in small ruminant marketing. There is no specialized market for sheep and goats in the Kecamatan Galang, so traders are an important link between farmers and consumers. Traders may be able to function as distributors of animal health care products to farmers. Wholesale dealers of animal medicines exist at the provincial level, but the delivery system from dealers to farmers needs to be improved. In the next phase one livestock trader and one shop keeper in the Kecamatan Galang will be instructed on the use and benefits of anthelmintics for farmers. After their training they will start to distibute anthelmintics to smallholder farmers.

1 INTRODUCTION

During this century animal production has been intensified all over the world. By using modern technologies such as automation, disease control and new breeding technologies animal productivity has been brought to a higher level.

Although this intensification has been exaggerated in some countries, which now causes ethic and environmental problems, intensification to a certain extent can be very beneficial for both farmer and consumer. In a lot of developing countries modern methods of animal production have hardly reached the smallholder farmers. By transferring some of those modern technologies to those farmers, not only their income, but also the income of other with these farmers connected industries will increase. So a higher standard of animal production will not only reward the individual farmer, but can contribute to a better economy as a whole.

In Indonesia new technologies are often available in urban areas, but they rarely reach the farmer in the field. The Animal Heath Delivery network will make an attempt to improve this situation by developing a link between wholesalers and farmers, using existing marketing channels. The project is focused on improving animal health care of sheep in North Sumatra.

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Since a major disease problem among sheep in North Sumatra is helminth infections (Heryanto et al, 1991), the emphasis will be on the delivery of anthelmintics for sheep. By using anthelmintics, this disease problem can be reduced, resulting in a lower mortality rate and a higher growth rate of the sheep. Anthelmintics have been proven beneficial for farming systems in which the sheep go out grazing every day, not only under experimental conditions, but also under village conditions (Beriajaya and Stevenson, 1986; Chaniago et al, 1984). The expenses made to purchase the anthelmintics will in general be lower than the extra economic returns as a result of the use of anthelmintics (Scholz, 1992).

Another supply which is very beneficial for sheep farmers is the use of mineral supplements (Panggabean, 1982; 1987). This is also a cheap and low risk input for sheep farmers, so this may become a part of the technology package offered as well. The project is situated in the Galang District (Kecamatan Galang, Kabupaten Deli Serdang). A map of this district is presented in Appendix 1.

To establish this link between farmers and wholesale dealers, a network between wholesale dealers, merchants or distributors and smallholder farmers has to be designed. A diagram of a possible network is presented in Figure 1.1. Livestock traders, local shops and extension workers might purchase their supplies from wholesale dealers in Medan. There is also a possibility that traders and extension workers will buy in the local shops if more convenient. They will distribute the supplies among farmers who want to make use of the offered services.

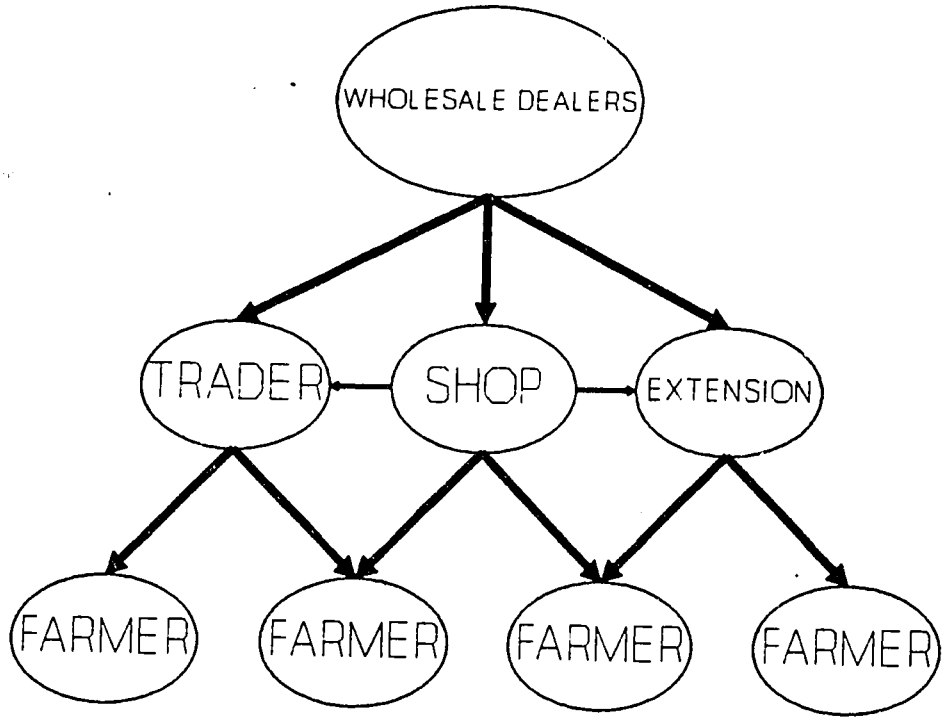

Figure 1.1 Possible design of an Animal Health care Delivery Network

The planned approach was presented earlier in a workplan, which is included in Appendix 2. In this plan four phases, spread over two years, are described. Phase 1 is the description of the current situation in the Kecamatan Galang where the project is situated. In

phase 2 the report of the first phase will be evaluated and a rough design for a network will be presented. In phase 3 all participants of the network will be informed and trained. After this the network will be started. In phase 4 the network will be controlled, monitored and evaluated two years after the beginning of the project.

This report contains the results of the first phase. Which started in March 1992 and was completed at the end of May 1992. The objective of this phase was to get a good picture of the current situation concerning animal health care for sheep especially in Kecamatan Galang. To establish this all parties which can possibly be involved in a future network were investigated. The data collected describing the current situation will also be used to evaluate the project in the fourth phase.

The investigation started with the final users of the network: the farmers. An investigation of the views of the farmers towards farming and animal health care is described in chapter 2. These farmers will have to obtain their farm supplies from traders. Possible candidates to act as traders of animal health supplies to farmers are: livestock traders, local shopkeepers and the Dinas Peternakan (the governmental extension service). They are described in chapter 3, 4 and 5 respectively. The traders of animal health care supplies will have to get their supplies from wholesale dealers or importers of medicines in Medan, who are described in chapter 6.

Finally this investigation leads towards the discussion and conclusions in chapter 7. In this chapter an attempt is made to integrate the result of the partial investigations in to one overview of the situation in the Galang area.
Chapter 8 contains recommendations for the next phase(s).

2 THE FARMERS

2.1 Introduction

Most farmers in Indonesia are smallholders who have some basic characteristics in common. Agricultural work is mostly carried out by family labor and the operating capital turnover in production is very low. This does not automatically imply that these farmers are not willing to spend money for the use of new technologies to increase their income, but because of the economic constraints they will avoid big risks. When the success of new technologies is proven for smallholders thus reducing the risk of using it, they even adopt these technologies earlier and more intensively than large farmers (Randhawa and Sundaram, 1990). Taking this into consideration the introduction of anthelmintics in sheep farming has good prospects because of the small investment for farmers and fast results. For the development of a distribution system of agricultural supplies information has to be known about the system of sheep farming and current infrastructure for supplies.

The objective of this chapter is to summarize information about sheep farming in the research area. General information as well as information from individual farmers was collected.

2.2 Material and methods

In Kecamatan Galang a group of farmers is actively supervised by the Small Ruminant Collaborative Research Support Program (SR-CRSP) these farmers are the Outreach Research Project (ORP) and live in the villages Galang Suka, Tanjung Gusti, Jaharun A, Sei Karang, Pulau

Gambar and Pulau Tagor, all in Kecamatan Galang. In the Kecamatan there are 38 small villages and a total of over 72000 inhabitants. The SR-CRSP has given four ewes to each of these ORP farmers in the last four years. These sheep have to be repaid, so each farmer has to pay back eight ewe lambs to the project. A more detailed description of the ORP is given by Soedjana et al. (1990).

This group of farmers has been closely followed since their start and have received extension from an extension worker of SR-CRSP. This extension worker also gives anthelmintics to the sheep every three months (Rintal, Bayer). Because a lot of information is known about those farmers and because they are familiar with the use of anthelmintics, this group are possible candidates to be selected for the initial group of the network which can expand to farmers outside this group after the initiation. To find out the knowledge and views of these farmers towards sheep farming and the use of anthelmintics, each of them (26) was visited and interviewed. A questionnaire, which is presented in Appendix 3, was used as a guideline during these interviews. This questionnaire was not followed exactly but an attempt was made to get the required information in informal conversations.

Also twenty non-ORP farmers in the Kecamatan Galang, not connected with SR-CRSP, were visited in order to investigate the knowledge of these farmers about animal health and the use of anthelmintics. Names and addresses of these farmers were obtained from the SR-CRSP extension worker and from the local office of Dinas Peternakan. Seven farmers were visited in the desa Pulau Gambar in cooperation with the extension worker of SR-CRSP and 13 were visited in Pulau Tagor and Jaharun A. in cooperation with an employee of Dinas Peternakan. Although this way of selection does not produce a completely random sample, some useful information could be collected from these non-ORP farmers. The same questionnaire was used for these farmers, although some additional questions about extension received from institutions other than SR-CRSP and Dinas Peternakan were asked and some questions regarding the extension offered by SR-CRSP were left out.

2.3 Results

2.3.1 General

Information obtained from Dinas Peternakan for Kabupaten Deli Serdang shows a growth of the sheep and goat population over the last four years (Table 2.1). Both sheep and goats are mentioned, because the production system for sheep and goat are similar and because some people mix up goat (kambing) and sheep (domba). This information is collected by the Dinas officers in the different districts of the kabupaten.

Table 2.1: Sheep and Goat population in kabupaten Deli Serdang, North Sumatra from 1988 to 1991.

	1988	1989	1990	1991
Goats	92 880	95 387	75 534	99 379
Sheep	10 380	10 660	17 212	15 296
Total	103 260	106 047	92 746	114 675

(Data source: Dinas Peternakan, Medan)

Kecamatan Galang has over 72 000 people and sheep population of 1 892 spread out over 158 farmers. Information about sheep farming in Galang

over the last four years is presented in Table 2.2.

Table 2.2: Sheep and Goat population in Kecamatan Galang, Deli Serdang, North Sumatra from 1988 to 1991.

	1988	1989	1990	1991
Goats	2 690	2 764	5 497	7 224
Sheep	293	380	1 042	1 892
Total	2 983	3 072	6 539	9 116

(Data sources: Dinas Peternakan, Medan; Dinas Peternakan, Galang)

Data concerning animal production is obtained from the extension officers in each district. In Galang District the information is obtained from the village heads, village district heads and is checked by the extension officer himself. This method of data collection produces reliable information.

According to the officer responsible for animal health care in Galang District, the area used to have a bigger goat population, but because of problems with scabies to which goats are highly susceptible, a lot of farmers are now shifting to sheep. These farmers use in general a farming system in which the sheep are fed in the barn in the morning (cut and carry) and go out grazing in the afternoon for about four hours, looked after by children. Especially because of the grazing period each day, worms are a serious threat to animal health.

The total numbers of sheep kept by the interviewed farmers are presented in Table 2.3. The average farm size of ORP farms seems to be bigger than the farm size of the non-ORP farmers interviewed and the average farmer, according to figures of Dinas Peternakan (1991), respectively 19, 9 and 9 sheep.

Table 2.3: Distribution of sheep kept by interviewed farmers in Kecamatan Galang

	number of farms	# YOUNG LAMBS		# WEANED LAMBS		# MATURE SHEEP		average # of sheep per farmer
		♀	♂	♀	♂	♀	♂	
ORP farmers	26	53	37	67	58	242	46	19.35
non-ORP farmers	20	25	14	19	12	95	18	9.15

The success of a farmer depends for a big part on his management (Chaniago et al, 1984). This management can not only be obtained by better extension and the use of anthelmintics, but some experience with farming will probably have a positive effect on the management skills of the farmer. In Table 2.4 the duration of experience of the farmers is presented.

Table 2.4: Duration of experience with sheep farming as a percentage of the interviewed farmers per group

	Years of experience				
	≤ 1	2	3	4	≥ 5
ORP farmers	19%	35%	4%	8%	11%
non-ORP farmers	45%	30%	15%	5%	5%

A large group of farmers in the non-ORP group recently became sheep farmers. This is partly because, as stated earlier, a lot of farmers changed from goats to sheep. A second reason is that a few of the interviewed farmers in Jaharun A only recently received sheep from a neighboring ORP-farmer.

2.3.2 Trade

The great majority of the farmers (80%) sell their animals at an age younger than one year (around 8 months). These sales are not particularly influenced by the price of the meat at that moment, but more by the financial needs of the farmers of which school fees for the children are mentioned the most. Only five ORP farmers said they take price fluctuations into account if they want to sell sheep.

All 11 non-ORP farmers who had sold sheep sell their animals to livestock traders. Of the ORP farmers 19 farmers have sold sheep. However, only 9 of them used agents while 15 of them often sell directly to non-ORP farmers and one ORP farmer even goes to the market himself. In a few cases the SR-CRSP extension worker acted as an agent in buying and selling sheep.

The majority of the farmers are visited by more than one agent. The frequency of the visits is in general once-a-month and sometimes less. The farmers who live very close to Kota Galang are also able to contact the livestock traders themselves if they want to. Approximately 50% of these visits are rewarded by a sheep transaction. This was the same among ORP farmers as well as non-ORP farmers.

2.3.3 Extension

Only a few (ORP 3, non-ORP 5) farmers ever heard of PPL, the governmental agricultural extension service and in these cases it was only the extension service for agricultural crops.

The existence of the person responsible for animal health in the kecamatan, menteri hewan (Mr. Sudijana) was better known among the non-ORP farmers than among the ORP farmers (Resp. 60% and 50%). The frequency of the visits is in general once-a-month. Eleven of the non-ORP farmers are visited by Mr. Sudijana, while 7 of the ORP farmers are visited once-a-month. Some farmers receive more frequent visits (once every weeks), because they are connected with Yasika (see section 2.3.5). The meetings often take place at the house of the farmers, but especially among the non-ORP farmers meetings are organized in a central place in the village. Most of the respondents would like to be visited more often by Mr. Sudijana.

There is also a possibility to call the animal health consultant in emergency cases. Seventy percent of farmers had called him, and in all cases the menteri hewan came directly. Four ORP farmers and four non-ORP farmers had received medicines like anthelmintics, feed stimulants,

vitamins and antibiotics from the menteri hewan. The majority of the farmers which are visited are very pleased with the services of the menteri hewan.

2.3.4 Extension by SR-CRSP

The extension worker of SR-CRSP, Jeplin Sihombing, goes to most ORP farmers once every two weeks, although in some cases the frequency is a little higher. He visits the farmers on a regular basis, according to 65% of the respondents. His main job is collecting data and giving extension. This extension is given verbally. The only written information the farmers have received has been a book about sheep farming, which most of the farmers received at the beginning of the project. The extension worker is often called whenever problems occur with the sheep, by contacting the SBPT office (21 farmers had done so). Also Jeplin comes directly in these emergency cases. Farmers are in general very pleased with the extension given and say they act according to the advice given. Also four non-ORP farmers interviewed receive extension from Jeplin. This personal project is not supervised by SR-CRSP and the anthelmintics which these farmers receive are not supplied by SR-CRSP, but bought in Galang.

2.3.5 Yasika

During the survey four farmers were visited who were connected with a organization called Yasika (Yayasan Indonesia Untuk Kemajuan Desa). This project has two locations in North Sumatra, one in Galang District (Pulau Gambar) and one in Kabupaten South Tapanuli. The Yasika project uses the same system as the SR-CRSP, the farmers receive four sheep and have to give them back in natural payment. The extension is given by the animal health consultant from the local Dinas Peternakan. In Galang he visits the farmers and every two weeks there is a meeting with him in the village meeting house, at which 20 farmers connected with Yasika attend. The farmers have to pay Rp 400 each month for extension and anthelmintics (Piperazine). Two employees of the Yasika project live in the village themselves and can be contacted by the farmers at any time.

2.3.6 Animal health care

When an animal has been ill, 17 of the ORP farmers went directly to the extension worker. From the non-ORP farmers only 3 went directly to the extension service in case of illness of an animal. Most of this last group tried to cure the disease themselves. The people who treat the animals themselves often use traditional medicines. Of the interviewed farmers, 50% regularly gave traditional medicines, the knowledge of which was obtained from other farmers, parents and extension workers. As for commercial medicines, all ORP farmers mentioned anthelmintics as supplied medicines and also vitamins and antibiotics were mentioned regularly. In the non-ORP group the use of commercial medicines and supplements was less common. Only six mentioned the use of them. The disease mentioned the most was bloat, which is was said to be a serious disease by 37% of the interviewed farmers.

Although worm infections are known to be a big problem in grazing systems as practiced in this area, only 65% of the interviewed ORP farmers were able to give a more or less accurate description of helminths. Of the non-ORP farmers only 6 (23%) could give an accurate description, and 5 of these gave anthelmintics to their animals assisted by Yasika or Jeplin. The rest did not know about worm infection and its symptoms. All the farmers who use anthelmintics, although they didn't all know what worm infections are exactly, thought

that giving anthelmintics is beneficial for growth, survival and body condition of the sheep. All ORP farmers could more or less recall at what date the last treatment was given, but only 85% were able to calculate when the next treatment should be given. Most ORP farmers (85%) didn't know the doses of the anthelmintic given by the extension worker of SR-CRSP. However, the farmers supported by Yasika knew all in what amount and how to give anthelmintics. The prices of the treatments were well known by all farmers who used anthelmintics. Most of the farmers said they would still purchase the anthelmintics if the price were to go up to twice the current price. Only one of the 31 farmers who received anthelmintics said it would be to expensive and 4 farmers did not know whether they would continue the treatments if the price per doses was higher.

All ORP farmers received a mineral block for the sheep at the time they joined the project. After the block was completely used they didn't receive a new one. Also some non-ORP farmers received mineral supplements from Dinas Peternakan, but not as a regular service. However, a lot of farmers, ORP as well as non-ORP farmers, would like to purchase mineral supplements if sold in a shop in Galang or by other agents. The decision to purchase these minerals will of course depend on the price of the blocks.

2.4 Discussion

Some general characteristics of the farmers in Kecamatan Galang can be given, based on the interviews held in the villages.
Farmers who are frequently visited by extension workers have high confidence in them and in general follow the advice of these people. There is still a big demand for extension among the farmers. Even farmers which are visited frequently want to be visited more often.

ORP farmers seem to know more about anthelmintics and helminth infections than other farmers, but they don't know how to give the medicines to their animals. The non-ORP farmers who use anthelmintics are better informed about the way of medication. Non-ORP farmers who don't use anthelmintics don't know exactly what worm infections are. Farmers who know the benefits of the use of anthelmintics and other supplements are willing to pay for them, even if the price is higher than what they pay at the moment. However most of the farmers don't show initiative to buy supplies themselves in the bigger villages, but if medicines are delivered, they are eager to buy them. The farms are in general very small, which excludes the possibility for the farmers to buy anthelmintics themselves from wholesale dealers because of the big quantities which are being sold at the moment.

As shown in other reports (Mathias-Mundy and Murdiati, 1991) traditional medicines are often used in Indonesia. There are a number of reasons for the use of these medicines:

* traditional medicines are very cheap;
* farmers are not aware of the benefits of commercial medicines;
* commercial medicines are just not available for the farmers.

Although the use of traditional medicines is common, this doesn't imply that commercial medicines will not be adopted by farmers.

3 LIVESTOCK TRADERS

3.1 Introduction

Livestock traders are an important link between the farmers and the final consumers of sheep meat. Farmers are often not able to market their animals themselves and have to sell the sheep to traders. Because of regular visits of livestock traders to farmers even in very remote areas, traders may be able to distribute animal health care supplies to these farmers.

This chapter will describe the way livestock traders work in the project area, their contact with the farmers and their own views towards the use of commercial medicines. Information about the livestock traders was obtained from personal conversations with a few traders. In one case a trader was observed during his work "in the field" for a period of two days.

3.2 Livestock traders in Kecamatan Galang and its surroundings

3.2.1 Livestock traders in general

In Kecamatan Galang and its surroundings, 5 livestock traders are active (Carlson and Scholz, 1991). These traders use either a motorbike or a bicycle for transportation, and are in this way able to visit even very remote areas. When they enter a village they sound their horn to get the attention of the inhabitants. If a farmer wants to sell an animal he calls the trader. The trader will also stop and ask for himself at houses of potential sellers. There are two main markets for the bought animals; other farmers and the slaughter house. The traders are part of a free market structure in which there is normal competition among the livestock traders, so the livestock traders do not have strong market power as suggested by Sabrani and Knipscheer (1982).

3.2.2 Livestock trader Suwondo: a case study

For a period of two days one livestock trader was observed during his daily work. This trader was selected because of good experiences of cooperation in the past. His approach is already described in section 3.2.1. Slaughter houses in Medan collect animals twice a week at the traders house, without any extra transportation costs. He appeared to have a lot of knowledge about sheep and goats in general and about animal health care. He showed knowledge of the danger of inbreeding in small flocks and about sheep and goat diseases like scabies and helminth infections. He already has experience injecting antibiotics in cows. In order to increase his trustworthiness with farmers he carries the name cards of scientists he has met. People are more eager to believe him if he has some prove of his knowledge. The reason why he doesn't sell anthelmintics yet is that the wholesalers only sell anthelmintics in big quantities. His knowledge of general animal health care seems good, but he needs extra training to learn ways of treatment and doses. For example, he only thinks in terms of injections without considering that other ways of medication are possible.

3.3 Economics

If a livestock trader operates as a distributor of animal medicines, he must make some profit on the transactions. The income of a full-time livestock trader at the moment is around Rp 340 000 a month. Total costs for the traders each month, calculated by Carlson and Scholz (1991), are: motorcycle and food Rp 105 000, storage costs Rp 15 000, commission to informants Rp 13 500 and other expenses Rp 9 000. Which

brings the total expenses to Rp 142 500 a month and thus a net return of about Rp 200 000. The cost price of anthelmintics is about Rp 200 per doses. Each animal has to be treated every three months. So if this trader wants to make an extra profit of Rp 50 000 a month with a profit per doses of Rp 200, he needs to serve 750 animals, or around 100 farmers. In the Kecamatan Galang about 150 sheep farmers are active, so it will be quite hard to reach this amount of animals served.

3.4 Conclusion

Livestock traders know a lot of farmers in the area, even in remote places. They are highly mobile and transportation costs don't have to be included in the economic calculations for these people, because they go to the villages anyhow. Livestock traders are probably willing to sell anthelmintics if some profit can be made. However not all farmers have a very high level of trust in the traders and visits to farmers are in general very short. Livestock traders who want to distribute medicines for animals should receive proper training to upgrade their knowledge about animal health care and to prevent improper use of medicines. A lot of farmers have too much faith in injections without knowing the effects on the animals.

Economically it is almost impossible to gain a sufficiently high income from distributing medicines alone. So the distribution has to act as a profitable second branch and interference with his main job of selling and buying animals has to be kept low. Still a large number of animals need to be served if a livestock trader wants to make some profit out of the distribution. The success of a distribution network with the use of a livestock trader also depends on how much the farmers trust the trader. Farmers are generally superstitious and may think the trader has just found another way to raise his level of income. A formal letter of recommendation from a known authority on animal production could increase the reliability of the trader.

4 LOCAL SHOPS

4.1 Introduction

One possibility of distributing medicines and supplies is local shops. The advantage of using local shops is that not only anthelmintics can be distributed, but also other supplies such as mineral supplements. Besides, the farmer is able to buy the supplies at any time and does not have to depend on the visits by the livestock-traders. Kota Galang is the biggest town in the district and a lot of stores are situated in the town center. In order to obtain information about shops which sell or might be able to sell animal health supplies in the future, personal interviews were conducted.

4.2 Local shops in Kota Galang

A number of shops in Galang Town sell pesticides and herbicides etc. for agricultural purposes. Although a lot of livestock farmers live in the Galang District, only two shops sell supplies for livestock farmers.

The first shop is called Serba Jadi and used to be a little poultry shop, but is now primarily a hardware store. The shop is still selling some equipment for chicken farmers. Piperazine anthelmintics sold for chicken in this shop can also be used for sheep. One of the customers of this shop is the extension worker of the SR-CRSP, who buys anthelmintics for the non-ORP farmers he visits. The price of these anthelmintics is Rp 500/10g and 5g anthelmintics is enough for 10 kg

body weight. This shop doesn't want to expand with supplies for animal production, because they want to specialize in iron and paint.

Another shop is called Israel and specializes in agricultural supplies, especially pesticides, insecticides, herbicides and fertilizer. Also concentrate for chickens and fish is available in this shop. They don't have a lot of medicines for animals, only some for chickens. The shopkeeper visits Medan twice a week and buys supplies at the Sumatra Poultry shop in Medan. The shop is willing to cooperate if there is a demand for medicines like anthelmintics.

4.3 Discussion

Only one shop in Kota Galang is willing to sell animal health care supplies. Before buying supplies the shopkeeper must be certain that the bought products will be sold, to avoid stock problems. If there is a definite demand from livestock farmers for certain supplies, they are willing to cooperate.

5 EXTENSION FOR FARMERS

5.1 Introduction

Farmers need not only physical input for their farms like feedstuffs, animals and labor. They also need support to improve their farm management. This input can be delivered by parents, other farmers and friends, but an important contribution to improve management of the farmer can come from extension workers. The general objective of extension is to bring modern technologies and management strategies to the farmer. This can only be achieved only if there is a good relation between farmer and extension worker. The farmer must have trust in the extension worker and willing to adopt the technologies he proposes.

After the interviews with the farmers it appeared that there are two major sources of extension in the project area. First the extension worker of SR-CRSP and second; the local Dinas Peternakan. In this chapter, these two parties will be described. With information which is derived from conversations with employees of the above mentioned institutions, together with the known information derived from the interviews with the farmers (chapter 2) a good impression of the situation concerning extension in the project area can be obtained.

5.2 Extension from SR-CRSP

The SR-CRSP extension worker, Jeplin Sihombing, visits the farmers connected with the ORP on regular basis. His main job is to collect data and give extension to the farmers. The frequency of his visits is at least once-a-week. ORP farmers mentioned a lower frequency but, according to Jeplin, this difference occurs because the farmers are often not at home when he visits them. In the absence of the farmer Jeplin only checks if the sheep still carry their number tags and if there are any new-born lambs. These visits take place from 9.00 - 13.00 and take not more than 1½ hour.

In the case of illness of an animal the extension worker is often called, sometimes even late in the evening. Not only farmers in the neighbourhood of the institute, also farmers further away make use of this extra service if necessary.

The services of the extension worker are not only available for ORP farmers, but Jeplin is prepared to give extension to other farmers who show an interest. By verbal advertisement among the farmer community

the group of non-ORP farmers served by the extension worker has expanded to 20 farmers. These other farmers all receive anthelmintics (premisi) once in three months, bought in a shop in Kota Galang. In case of illness of animals, Jeplin buys antibiotics in the same shop. These farmers do not pay for his services directly, but pay Rp 250/animal for the anthelminthic treatment while the actual buying price is Rp 170/animal. The 20 farmers own an average of 17 animals, which means a profit for the extension worker of about Rp 9 000/month. A special case of extension is the extension to a farmer who owns over 100 sheep in the Kecamatan Pagar Merbau, who pays Jeplin Rp 3000 per visit for his services. All these farmers are in general visited once a week.

The extension worker of SR-CRSP has no professional contact with the government extension service, Dinas Peternakan, which has the same working area.

Another task of the extension worker is to select new farmers for the ORP. After a new candidate has written a letter of application, his case will be scanned by the supervisor of the ORP, Elianor Sembiring, together with the extension worker. Farmers who are selected after the first screening will be visited by the extension worker and a long personal interview, which can last up to four hours, will take place. Every year about 4 farmers are added to the ORP. At this moment 25 requests from farmers are being considered.

At the moment no mineral supplements are distributed by the extension worker, but he is willing to learn how to make mineral blocks because a lot of farmers would like to buy these blocks.

5.3 Extension from the government extension service (Dinas Peternakan)

A general problem with extension in developing countries is the lack of manpower and adequate mobility. Most agents have to cover too many farmers spread over a large area, because of which some farmers will not be visited at all and other farmers will not receive the attention they need for good farm management (Benor and Harrison, 1977).

Kabupaten Deli Serdang has 36 extension officers for animal production, 11 artificial inseminators and 16 animal health consultants. They work in 33 kecamatan and the distribution of manpower depends on the livestock density in the different districts.

In Kecamatan Galang three people are responsible for the services offered by the Dinas Peternakan. Mr. Idris for artificial insemination of cattle, Mr. Sudijana for animal health. In this Kecamatan manpower is a big problem, therefore a new person was appointed for general extension in May 1992, Mr. Ratna Dewi. Still the employees have barely enough time to perform their basic tasks. Mr. Sudijana and Mr. Idris have both more than ten years experience in this area (starting years 1965 and 1978 resp.).

Farmers are visited when they ask for it. Mr. Sudijana is called about two times a week because of animal health care problems with any kind of farm animals. Another way for farmers contact Dinas Peternakan is during meetings of farmer groups (kelompok) which take place once a week. These farmer groups receive information about agriculture in general. Animal production is one section of the program. In Galang District eight of these farmer groups are active. About twenty farmers are visited individually each week, but only if the farm size is big enough. The research institute in Sei Putih (SBPT) has a good relationship with the local agricultural extension service. The

institute is visited once a month and in case of problems with animal health.

In case of animal diseases, first an attempt is made to cure these with cheap traditional medicines, before the use commercial medicines is suggested by Dinas Peternakan. Because of his years of experience Mr. Sudijana uses medicines which have been proven beneficial for certain animals or diseases. The treatments with commercial medicines are mostly given by an employee of Dinas Peternakan, because farmers generally don't know the dose and method of treatment. At all times a choice has to be made to use a certain medicine based on expected result and price, because expensive medicines happen to be more effective than cheap medicines. Supplies for animal production offered by Dinas Peternakan include mineral supplements, vitamins, anthelmintics and antibiotics. The amount of money paid for these supplies depend on the budget of the Dinas Peternakan and because of this the price is not always the same and sometimes anthelmintics are distributed free of charge. Some farmers receive all medicines free of charge, because the animals are the property of the government. Supplies are purchased in Medan, once a month by Sudijana. The brand of medicines used depends on the medicines available at the moment of demand. The kind of anthelmintics that contain the active component piperazine are generally very cheap. An example of these anthelmintics used by the Dinas Peternakan is Piperex, which is still quite effective. One very effective medicine against intestinal worms is Nemafax, which is used by the Dinas Peternakan and can be purchased for a lower price because of governmental subsidy. But compared with piperazine containing medicines Nemafax is still rather expensive (Dinas price: Rp. 100 000/kg, normal price: Rp. 173 000/kg).

The Dinas Peternakan supports the general idea that more medicines have to be available for farmers in Galang District.

6 WHOLE SALE DEALERS IN MEDAN

6.1 Introduction

As new animal production technologies are developed there is an increasing use of medicines and other commercial products on farms. Until now a marketing system for these medicines in Deli Serdang is not yet operating. Animal medicines in North Sumatra are sold mainly in poultry shops in large towns. Anthelmintics for ruminants are also sold by specialized wholesale dealers in Medan.

One of the reasons why farmers do not use those commercial animal medicines is because these medicines are normally not sold in small villages. In order to study the present marketing system several wholesale dealers in Medan were visited.

6.2 Materials and Methods

In Medan there are numerous poultry shops and the goods sold in each one are almost identical. Three wholesale dealers of animal medicines in Medan were visited in order to obtain information about their marketing approach: two poultry shops and one specialized distributor of animal medicines.

The poultry shops dealers visited were "Harapan Ternak" and "Sunggal Poultry shop". "PT PD Djawa Maluku" is a special distributor for Bayer products.

6.3 Results

The price of each anthelmintic depends highly on the trademark and size of package. A smaller size of package increases the price per gram of anthelmintic. In each shop there is variation of the minimum size that can be bought. This minimum size of package depends on consumer demand. If farmers are willing to pay a certain price for a package size they prefer, these packages will be sold. But especially for smallholders who buy only little amounts these prices will be high. Farmers tend to buy cheaper anthelmintics rather than better quality.

Piperazine, sold as Ultra worm from "Pyridam" is sold in 10 gram packages. However the smallest size of packing for Febantel (Rintal, Bayer) sold by PT PD Djawa Maluku is 1 kg.

A list of the prices, types and size of package of each anthelmintic sold by wholesale dealers is presented in Table 6.1.

Table 6.1.: Price, type and size of packing of each anthelmintic sold by wholesale dealers in Medan.

No	Type	Product	For animals	Kind	Price (Rp)	Doses
1.	Ipermisol	Iperma	Sheep,pigs	meal	4000/100 g	1 g/10 kg BW
2.	Worm X	Prizer	Pigs, dogs cats	liquid	2500/120 ml 14800/1 l	2 table spoon / 100 chickens 2 table spoons/ 45 kg BW (sheep and pigs)
3.	Carisid	Rhone Poulenc	Chickens, horses and pigs	liquid	13350/1 l 62000/5 l	30 ml Carisid/ 3 l water/ 100 chicks 60 ml Carisid/3 l water/100 chickens 5 ml Carisid/10 kg BW + water
4.	Ultra worm	Pyridam	Horses, cows sheep and pigs	meal	370/10 g 2975/100 g 13500/500 g 25600/1 k g 118500/1250 g 121000/1500 g	5 g/10 kg BW
5.	Vermizyn SBK	Medion	Cows,sheep goats,horses and pigs	meal	1725/100 g 3400/500 g 16400/1 kg 79700/5 kg 232000/15 kg 750000/50 kg	3 g/10 kg BW pigs 10 g/50 kg Bw calfs and horses 20 g/100 kg BW cows and horses 5 g/10 kg BW sheep and goats
6.	Nemafax	Eurindo			43250/250 g	
7.	Piperex	Squibb			304700/10 kg	
8.	Rintal boli	Bayer	Ruminants, horses, dogs	bolus	42647/20 boli	
9.	Rintal gran.10%	Bayer	All kinds of livestock	meal	167647/1 kg	
10	Rintal prem.12½%	Bayer	fowls, pigs	meal	257353/1.5 kg	

There are some other medicines sold in both wholesale dealer and poultry shops, especially antibiotics and vitamins. PT PD Djawa Maluku sells "Bayer" products only. Also mineral supplements are sold by some of the shops visited.

PT PD Djawa Maluku has salesman to promote medicines and supervise the use of them. However, poultry shops don't have salesmen, for the use of the medicines the information needed must be read on the label.

6.5 Conclusion

According to animal medicine dealers in Medan, smallholder farmers in North Sumatra do not realize the importance of using anthelmintics. This is mainly because sheep farming is a minor component in the farming systems of the smallholder farmers. Anthelmintics are bought from dealers in Medan mainly by the bigger enterprises which don't complain about the big size of packing.

7 DISCUSSION AND CONCLUSION

The intention of this first phase was to get an impression of the current animal health care situation in Galang District. The results of the first phase will determine the recommendations for the next phase which is described in Chapter 8.

The farmers who are already familiar with the use of anthelmintics know the benefits of using them. At the moment farmers from ORP buy their anthelmintics from the SR-CRSP. The extension worker delivers the medicines and administers them to the animals. This is also the reason that those farmers don't know how to use the anthelmintics. In general farmers who are not connected with ORP and use anthelmintics obtained from Dinas Peternakan know how to use anthelmintics. Most of these farmers know how often anthelmintics should be given. Farmers who don't know what anthelmintics are, are not aware of the benefits of the use of anthelmintics. If anthelmintics are available, most farmers are willing to buy them, and would like the selling place as near as possible, preferably at their home. Most farmers who already use anthelmintics are willing to pay twice the price they are paying right now.

Because most of the farmers are willing to pay more than the price they are paying right now (cost price) it is possible to start an independent delivery network in which some profit can be made by the distributors of anthelmintics.

Livestock traders don't visit farmers on a regular basis. They visit villages and if a farmer wants to sell an animal he stops the trader by calling him. In this way the trader is able to visit a lot of villages each day and his working area is very stretched out. But because of this method the time spent with farmers is short and the transfer of information about things other than selling and buying animals is still limited.

The local shops most suitable for the distribution of anthelmintics are shops which already sell medicines for other animals like chickens. In Kota Galang only one shop is willing to sell anthelmintics for sheep.

At the moment extension is provided for farmers in Galang District by two organizations. First, the government extension service, Dinas Peternakan and second, the extension service of the SR-CRSP. Both organizations provide anthelmintics.

The government service however doesn't provide the medicines regularly, except to farmers connected with the Yasika project. Although the person responsible for animal health in this district is very active, the extension service is not able to extend the number of farmers served because of lack of manpower. The prices of medicines distributed

by the government extension workers are low because of subsidies.

The extension provided by the SR-CRSP has the distribution of anthelmintics in its technology package, and anthelmintic is sold at wholesalers prices (Rp 250/adult sheep). If the SR-CRSP decides to stop this distribution, the extension worker is willing to continue distributing anthelmintic as a private enterprise. In this way also farmers who are not connected with the SR-CRSP can be served, but prices will go up. The extension worker of SR-CRSP already has contact with non-ORP farmers who want to make use of his services.

All three possible methods of distribution have their advantages and disadvantages. The livestock traders cover a large area and are able to visit a lot of farmers, but farmers do not trust them as much as an extension worker. Farmers are willing to follow the advice of extension workers. However, the number of farmers visited by extension workers is limited. Local shops have the disadvantage that farmers have to go there to buy the anthelmintics; but an advantage is that farmers no longer depend on another person to deliver the medicines.

The wholesale dealers of anthelmintics can be divided into poultry shops and distributors of one certain trade mark. In poultry shops several brands of anthelmintics for small ruminants are available. In general the medicines are available in large packages. The wholesale dealers are not prepared to sell anthelmintics in smaller packages.

Since the wholesale dealers are not willing to sell the anthelmintics in smaller amounts, the distributors in the animal health care delivery network have to buy large amounts and make smaller packages themselves. This implies the distributors have to know how to use anthelmintics and how much is needed for one animal.

8 RECOMMENDATIONS FOR THE NEXT PHASES

As already mentioned in the discussion and conclusion, livestock trader, local shops and the SR-CRSP extension worker are possible distributors of anthelmintics. Al three have their advantages and disadvantages. Therefore our recommendation for the next phase is to start the delivery network using all three of them. In this way farmers who live far away from the village can buy anthelmintics from the livestock trader, farmers who are already visited on a regular basis by the extension worker can buy medicines from him and farmers who prefer to be independent can purchase anthelmintics themselves in the local shop.

The extension worker already knows how to use anthelmintics and how often it should be given to the animals. The local shopkeeper and the livestock trader however do not. They should be trained properly. This training could be given at by the SR-CRSP at the animal research institute. The training will take one or two days only, during which the trader and the shopkeeper learn how to give anthelmintics, how often, how much per animal and what are the benefits of the use of anthelmintics. To increase the trustworthiness of the distributors it is preferable to give them a certificate which states that they have followed a course on anthelmintics.

Since there is no proper and clear written information available for farmers on how to use anthelmintics, a sheet with all the necessary information should be designed. To be clear it must contain only limited information; what anthelmintics are, what the benefits of the use of them are and how to use them. A sheet with a lot of pictures and a little written text would be preferable.

The distributors have to buy the medicines in Medan in rather large amounts. All three of them don't have enough cash to pay for anthelmintics in advance or are not willing to take the risk of buying supplies without certainty of selling them. Therefore the project should lend money to the distributors so they can pay for medicines in advance, to give them the opportunity to sell the anthelmintics and return the money after they have sold the anthelmintics. Advice about prices should be given and, especially in the first period of selling, the product prices should be low.

When the distribution network is initiated, the heads of all the villages in Kecamatan Galang should be informed. They can tell the farmers in their villages where they can buy anthelmintics for their small ruminants. In order to see how the network is developing all three distributors should keep records of how much anthelmintic is sold and to where it is sold. Every month this information should be collected and discussed with the distributors to detect difficulties and problems. The monitoring should not include monitoring of sheep productivity because the farm results of farmers who don't use anthelmintics yet are not known and because farm results do not depend only on the use of anthelmintics. If productivity increases after using anthelmintics, this progress is not necessarily caused by the use of the medicines.

If the distribution network is operating in Galang District and the results are satisfying, a similar network could be started in other districts as well.

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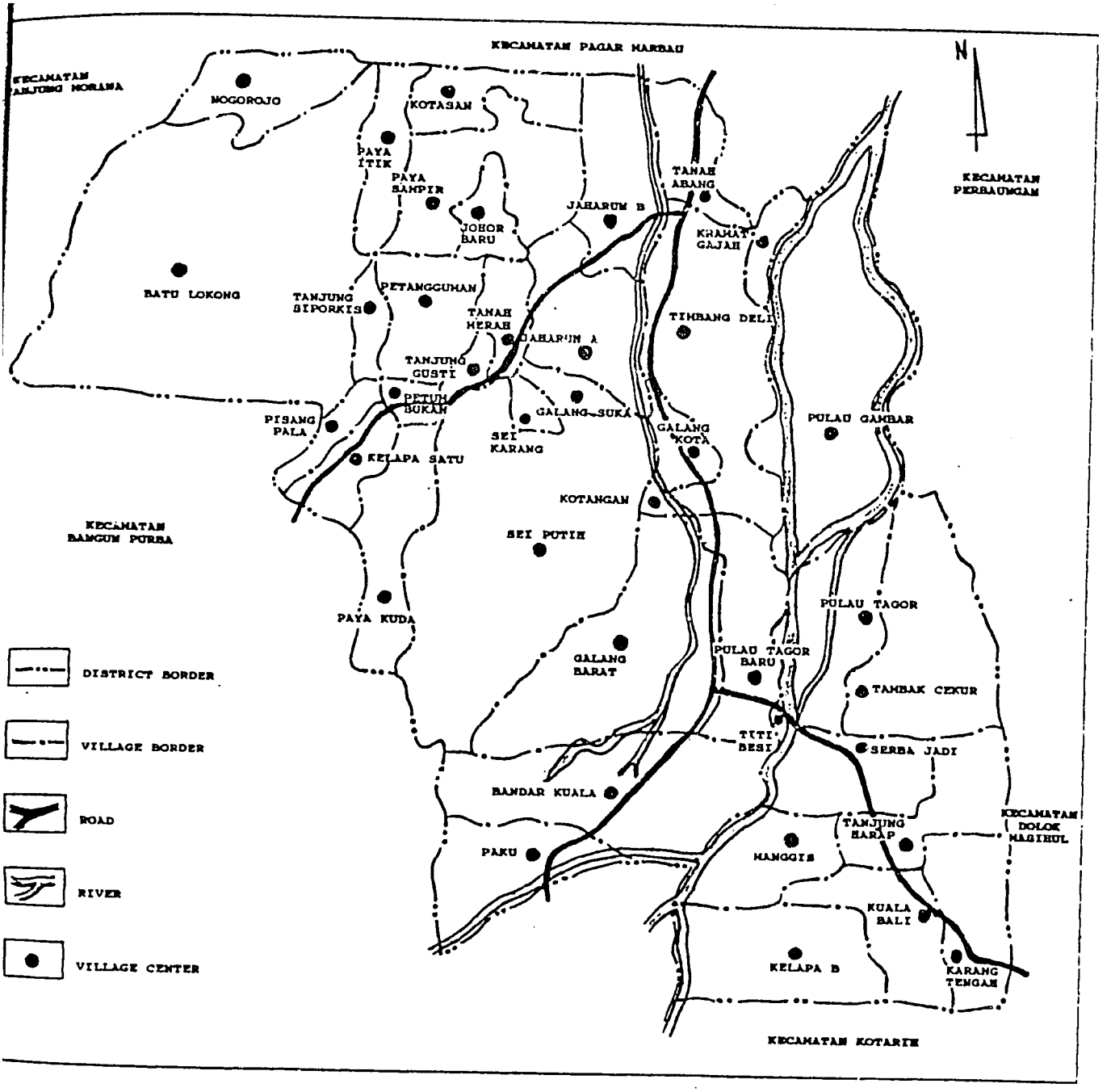
APPENDIX 1.

MAP OF THE GALANG DISTRICT

(KECAMATAN GALANG)

Scale: 1 : 100,000



APPENDIX 2

Workplan of the development for an Animal Health Delivery Network in North Sumatra

Objective:
The objective of the project is to develop an animal health delivery network for sheep in North Sumatra. The animal health delivery network will be developed in the Sungai Putih area, kecamatan Galang, Deli Serdang, Sumatera Utara. The emphasis will be on the delivery of anthelmintics for sheep. The delivery network will be developed with cooperation of existing marketing channels, so no new traders/distributors will be introduced in the area.

Phase 1: Description of the current situation

In phase 1 necessary information to describe the current situation in the Sungai Putih area will be collected. Based on this collected information the network will be designed.
Parties which are involved are:
* farmers
* traders
* local shopkeepers
* wholesaler dealers in Medan
* Dinas Peternakan

Farmers
In the Sei Putih area there are 26 ORP sheep farmers, who are, at the moment, supported by the SR-CRSP. The ORP project started in 1986 with the distribution of sheep to small-holder rubber-tappers. These farmers already use anthelmintics, distributed by SR-CRSP for wholesale price. A lot of information about the ORP-farmers is present at SR-CRSP which can be used. Additional data will be collected by personal interviews of all the ORP-farmers. A possibility to register the received information is using a questionnaire (done by the interviewer).
Additional data which will be collected:
- knowledge of the farmers about anthelmintics (use, purpose, benefits).
- sources from which they get their information (extension worker, Dinas Peternakan, other farmers).
- frequency of visits (by traders, by Dinas, to local shops)
- their attitudes towards the use and the costs of anthelmintics.
- which distribution-points do the farmers prefer?

Livestock-traders
Last year several livestock-traders were involved in a marketing-study conducted by SR-CRSP. Some data from these traders is already known. Because of experiences of SR-CRSP in the past it is very likely that they will co-operate in this project. Additional information will be collected by personal interviews.
Additional data which will be collected:
- their knowledge about medicines
- their level of education
- the area in which they operate
- which farmers are visited by which trader
- the frequency of visits to farmers
- their attitudes towards selling of anthelmintics and the use of anthelmintics.

Local shopkeepers
Another possibility of distributing medicines and supplies are local shops. For this local shops in Galang have to be identified and

eventually selected. The advantage of using local shops is that not only anthelmintics can be distributed, but also other supplies (like mineral supplements). Besides, the farmer is able to buy the supplies at any time. It doesn't depend on the frequency of the visits by the livestock-trader. At first we will select a number of shops which are somehow connected with the farmers (e.g. hardware stores). Information from some shops in Galang will be obtained by visits and personal interviews. Data which will be collected:

- distance to the farmers
- contact with farmers
- level of education
- attitudes towards selling of anthelmintics and the use of anthelmintics.

Wholesale dealers in Medan

Several wholesale dealers in animal medicines are already acquainted with SR-CRSP. These wholesale dealers will be visited and interviewed to collect the following data:

- prices of anthelmintics
- minimal amount which can be bought
- what kind of medicines they sell
- what information is available and included with the medicines
- what is the smallest form to distribute medicines (tablet, packages for small numbers of animals)
- attitudes towards selling of anthelmintics and the use of anthelmintics.

Dinas Peternakan

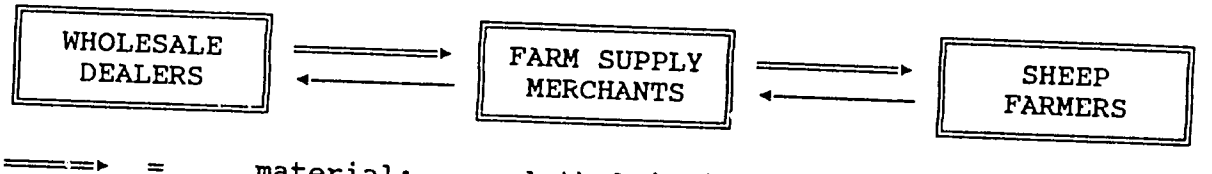
The Dinas Peternakan is also a possibility to distribute farm-supplies, but resources are limited (financial, personnel, mobility etc.). Though the D.P. is perhaps not the right institution to distribute medicines, maybe they will act as a consultative organization to provide the farmer with information about the use of medicines. Even if they will not be involved in the network, it is important that they will be informed about the project to avoid resistance from the D.P.. A meeting with Dinas-officials will be arranged (kecamatan and kabupaten level).

Information which will be obtained during the meeting(s):

- frequency of visiting the farmers
- the information they provide
- their knowledge of anthelmintics
- their abilities (financial, personnel, mobility, etc.)

Phase 2: Design of the Animal Health Delivery Network

After the collected data is analyzed, the AHDN can be designed. The initial design will consist of three levels: Wholesale dealer, merchants and farmers (see figure 1).



⟹ = material: Anthelmintics
non-material: Information about the use of anthelmintics

⟸ = material: Money
non-material: Feedback (questions, recommendations)

Figure 1: Basic design of an Animal Health Delivery Network

The final design highly depends on the results of the first phase. In

the second phase parties will be selected which are most suited to be a part of the initial network. For each level, different criteria are used.

Farmers: a group of innovative farmers will be selected initially. These farmers have to be aware of costs and benefits of the use of anthelmintics. If the network works, other farmers will follow their example. They have to be open, innovative and cooperative, thus capable of developing a AHDN.

Merchants: Criteria used for the selection of merchants are: frequency of visits, attitude towards anthelmintics, they have to cover the area in which selected farmers are located and of course they have to be willing to cooperate in the development of the network. The possibility of the use of more than one merchant (livestock trader or shop) is not to be excluded.

Wholesale dealers: those dealers who are willing to cooperate and are prepared to sell and package the anthelmintics in small quantities and provide written information and instructions for the use of the medicines. Other factors such as price, experience in the past with these dealers and availability of the anthelmintics will be considered as well.

Phase 3: initiating the Animal Health Delivery Network

Informing the selected participants

After the first selection, the participants have to be informed properly. The reason and purpose of the project has to be explained and they must be able to react to what will be proposed. In this way the design can be changed to suit the participants. Besides, by discussing the design they will probably be more motivated, which is essential for the success of the AHDN. The participants will have to get acquainted with the previous and the next level in the network.

Training the participants

Especially the merchants need to have enough knowledge about the medicines which will be used to provide the farmers not only with the medicines itself, but also with the needed information about use, purpose and doses of the medicines. Not only verbal information, also written information should be provided by either the wholesale dealer or the merchant. This information must be clear enough to the farmer.

Initiating the designed network

The best way to start the AHDN is to just inform the people and to give the first push. This of course is the ideal situation.
It is possible that the selected merchant doesn't have enough cash money to buy the medicines himself, so a credit system would have to be designed. Maybe the wholesale dealer can give him some credit or the project will have to it. In either case, this credit has to be paid back, because the network must be self-supporting, not depending on outside support.

Phase 4: control and evaluation

The network has to be monitored for several reasons.
First, because exploitation of farmers must be avoided. Price control will be needed as long as there is no competition between different merchants/wholesale dealers in the area.
Second, because problems discovered at an early stage of the project can be adjusted. When an error in the network should be discovered too late, it will be more difficult to make adjustments and in the worst case, the cooperation of some involved parties could be lost.
Third, for the evaluation of the project it is necessary to know whether the network is working and if it is developing itself.

Criteria that can be used for control and evaluation are:

- amount of sold medicines
- number of new farmers buying medicines since the initiation
- number of farmer that dropped-out since the initiation
- possible increase of merchants selling medicines
- views of participants (interviews/questionnaires)
- use of technical data of the selected farmers. These data can be influenced by the participation the project

This information should be collected every 3 months (because anthelmintics will be provided to the animals every 1-3 months).

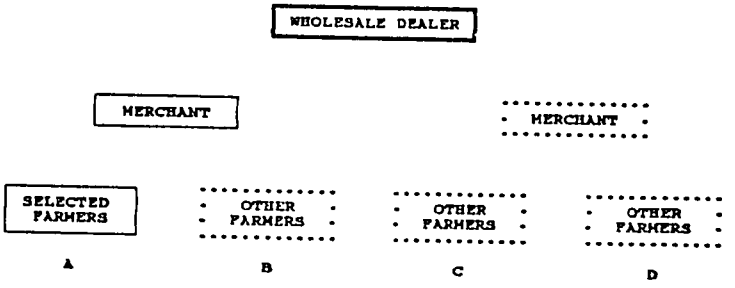


Figure 2: Schematic design of an AHDN and possibilities of expansion, under the assumption that there is one wholesale dealer.

Figure 2 shows the schematic design of an AHDN and the possibilities of expansion. Initially, one selected group of farmers will be involved in the project (A). Later on, other farmers who are in contact with the same merchant will follow (B). To create a environment in which natural competition other merchants should get involved as well, so farmers can choose between a few options which will have a positive effect on the prices of the provided medicines (C). The involvement of other merchants can also mean an expansion of the market (D).

Tentative time schedule 1992

The tentative time schedule (figure 3) covers the first year of the project. Ton van Schie and Joost Verwilghen will probably be in Indonesia until the end of May 1992, so according to the time schedule they will be able to cooperate in phase 1, phase 2 and the start of phase 3. After May 1992 probably one or two students from the Agricultural University Wageningen will take over their work.

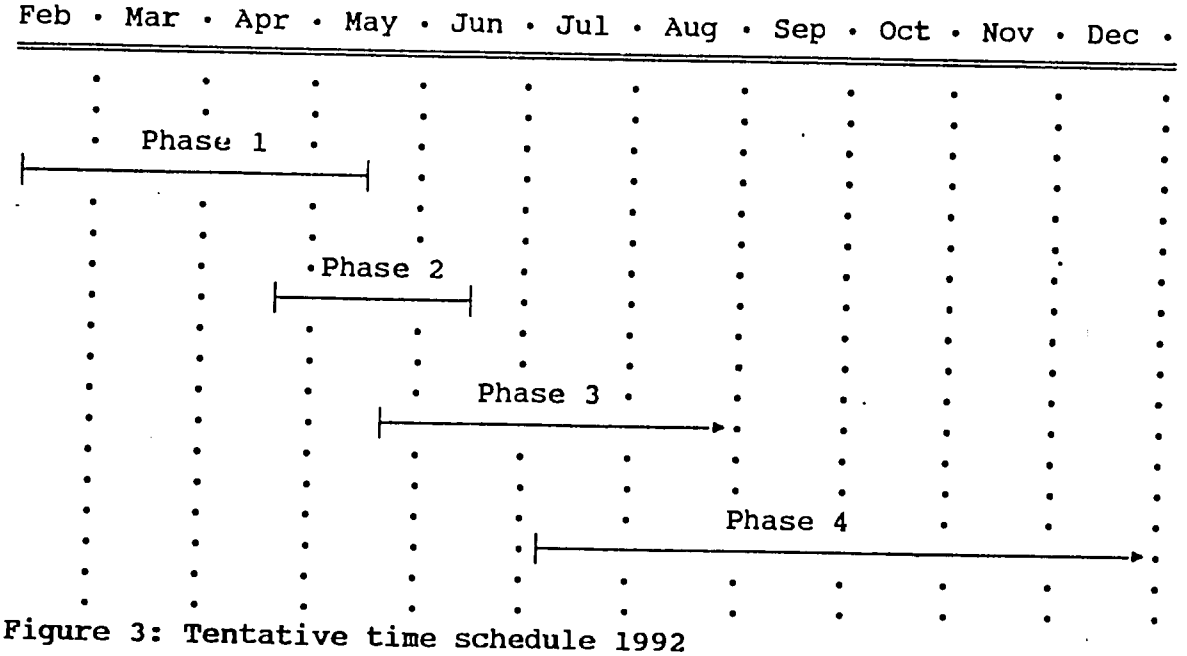


Figure 3: Tentative time schedule 1992

APPENDIX 3

Questionnaire for farmers.

These questions are not used literary, but during a conversation with the farmer.

General

How long have you been a sheep farmer?
How many sheep did you receive at first?
How many ewes do you have at this moment?
How many lambs do you have at this moment?

About traders

When do you sell those lambs, at what age?
- O <12 months
- O 12-15 months
- O >15 months
- O Don't know

Do you save animals for special occasions and sell them at a moment when the price is higher?
- O no
- O yes
- O Don't know

To whom do you sell your lambs? .....
Is it always the same trader? O yes O no
Do other traders visit you? O yes O no

How often does the trader visit you?
- O more than once a week
- O 1 X in a week
- O 1 X in two weeks
- O 1 X in a month
- O < 1 in a month
- O not at all

When did he visit you last? .....
Did the trader buy a animal from you at that visit? O yes O no

About extension provided by governmental organizations

Have you ever heard of PPL (extension field staff? O yes O no
What is the name of the PPL you know? .....

O more than once a week
O 1 X in a week
O 1 X in two weeks
O 1 X in a month
O < 1 in a month
O not at all

Does he come at regular basis? O yes O no
What do you think about the frequency of these visits?
O to often
O good
O not enough

Where do you usually meet PPL?
O at home
O DINAS office
O at other farms

What does the PPL usually do?
O provide extension
O collect data

How does he provide information?
O verbal
O written (leaflets etc)
O both

Do you contact him if you need him, and if so how often does such situations occur? .....
Does he come when you contact him? O yes O no O sometimes
Do you generally use the advise/information from PPL, if not why?
.....

What do you think about the services offered?
O good
O could be better
O not good at all
O don't know

Menteri hewan: same questions as PPL

Extension provided by SR-CRSP: same questions as PPL

About contact with other farmers?

Do you speak a lot to other farmers about sheep? O yes O no
Are you a member of a farmer group? O yes O no

If so how often do you meet?

- O 1 X in a week
- O 1 X in two weeks
- O 1 X in a month
- O 1 X in two months
- O < 1 in two months
- O not at all

What information do you generally exchange? .....
Where do you usually meet? .....
Of how many farmers does such a group exist? .....

Animal diseases

What do you do when an animal is ill?

- O ask other farmers
- O ask extension office
- O fix it yourself
- O do nothing

If you fix it yourself what medicines do you use?

- O traditional medicines
- O commercial medicines
- O no medicines

Anthelmintics

Do you know what parasites are (worms)? O yes O no
Do you give anthelmintics to your sheep? O yes O no
Do you think the condition of the sheep improves by giving anthelmintics?

- O yes
- O no
- O don't know

Do you think the sheep will grow faster by giving anthelmintics?

- O yes
- O no
- O don't know

Do you think there is less mortality when you give anthelmintics?

- O yes
- O no
- O don't know

When did you last give the anthelmintics? .....
Did somebody help you with that? O yes O no
When will you give anthelmintics again? .....
How much do you give to each sheep? .....g
How much do you pay for each treatment? Rp .....

If the price will be twice as much, would you still use it?

- O yes
- O no
- O don't know

Other supplies

Do you give mineral supplement to your animals? O yes , O no

Who makes the blocks?

- O make blocks yourself
- O SR-CRSP
- O local shop
- O other farmer

If you could buy them, would you do that?

- O yes
- O no
- O don't know

When you want to buy farm supplies where do you usually buy them?

- O local shop
- O visiting merchants
- O other farmers

In what town? .....

At what shop? .....

What kind of supplies do you usually buy? .....

How often do you go to Galang (or another town)?

- O more than once a week
- O 1 X in a week
- O 1 X in two weeks
- O 1 X in a month
- O < 1 in a month
- O not at all