

Results Scoping Mission Knowledge Partnership for a Healthy Livestock Sector in Bangladesh

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1. Introduction

The Embassy of the Kingdom of the Netherlands (EKN) is investigating the establishment of a partnership with the Bangladesh Ministry of Livestock and Fisheries (MOFL) that will be supportive to a new livestock development project in Bangladesh. This livestock project is called Dairy Revolution and Meat Production (DRMP). It will be financed partly by an IDA credit of the World Bank of US\$ 500 million, and by Government of Bangladesh (GoB).

The partnership between EKN and MOFL is referred to in this document as the Livestock Knowledge Partnership (LKP) and is aiming at support forms such as technical assistance, knowledge development, innovation and capacity building. EKN and World Bank expect that these elements of support to the DRMP project will scale up the impact of the DRMP project. Next to that the use of Dutch knowledge with regard to intensive and sustainable high quality livestock production is expected to support achieving the goals set by the GoB.

This paper describes the results of a scoping mission to explore the potential for such a LKP. The scoping mission was held from February 3rd until February 13th in 2018 and carried out by Catharien Terwisscha van Scheltinga and Jelle Zijlstra from Wageningen University & Research (WUR)

2. Objectives scoping mission

In order to investigate the potential for this type of partnership a scoping mission was planned that had to define first steps to the possible establishment of the LKP. The objective of the scoping mission is: "The further elaboration of the focus, the constitutional arrangements, the different partners (in Bangladesh and the Netherlands) and approaches safeguarding national ownership, and financial implications"¹. In close collaboration with the EKN in Dhaka these objectives were elaborated to the next three sub goals:

- Identify knowledge and capacity gaps to improve the profitability of the livestock sector.
- Identify lessons learned in BD on the creation and dissemination of knowledge and innovations.
- Find possible options, structure and modalities of the LKP.

3. Background of the initiative of Bangladesh World Bank project on livestock development²

The livestock sector in Bangladesh plays an important role for poverty reduction, food security and creation of jobs and livelihoods for rural areas. As the incomes in Bangladesh are increasing and diets are shifting gradually to animal protein, the demand of livestock products is expected to grow rapidly. Although the domestic production of livestock products is growing, it is not keeping up with the increase in consumption, resulting in rapidly growing deficits. The country's 7th Five Year Plan anticipates the annual deficits of 1.5 billion eggs, 0.5 million tons of meat, and more than 5.9 million tons of milk between 2015 and 2021. The growth of the livestock sector is resulting in increased imports of fodder, mainly corn and soybeans.

The transformation to increased rice production started in the seventies of the last century and is called the Green Revolution. In Bangladesh this has led to the country's self-sufficiency in rice. More recently the country is setting a next step in increasing protein production by aquaculture, and this is referred to as the Blue Revolution. The next big step will be to fulfil the need of the fast growing Bangladesh population by increasing milk and meat production of the livestock sector. This ambition of the government to become self-sufficient for milk is referred to as the dairy or White Revolution.

¹ Copied from "A knowledge Partnership for a Healthy Livestock Sector in Bangladesh", published by ██████████ of the World Bank.

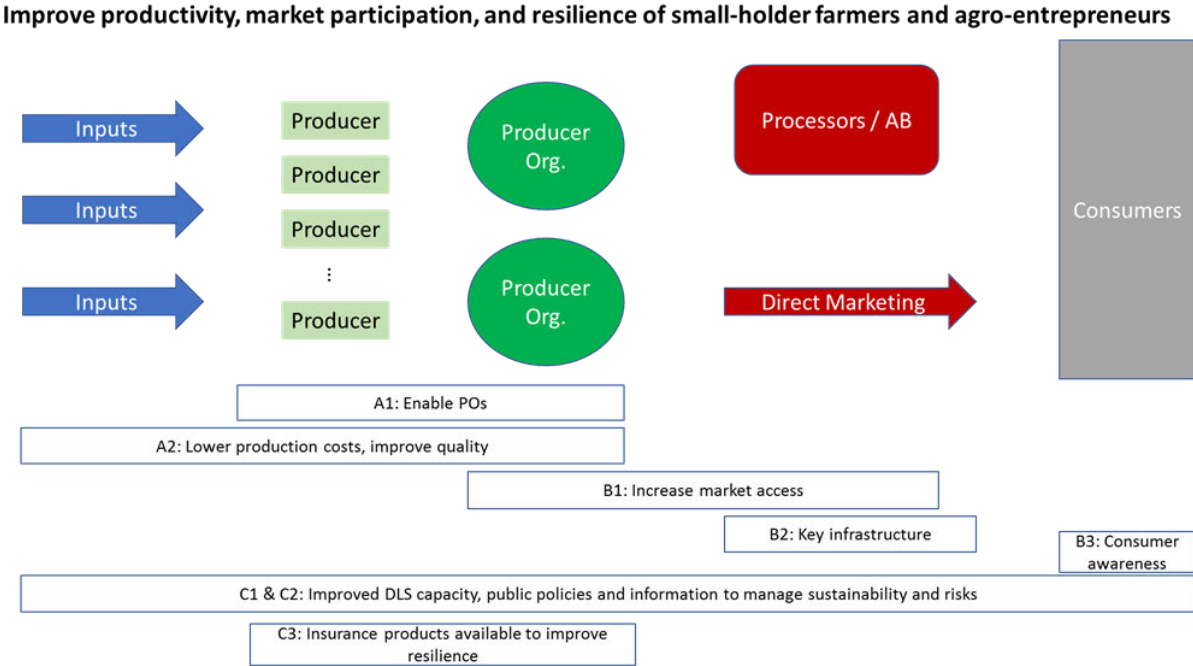
² Text largely based on Project Appraisal Document of World Bank: Livestock development-based Dairy Revolution and Meat Production project, version available to the authors of this concept note in February 2018 (version of December 28th, 2017)

This desired growth of animal-source food was the reason for the GoB to come to a project called Dairy Revolution and Meat Production (DRMP) that will be partly financed by an IDA credit of the World Bank of US\$ 500 million. The GoB and beneficiaries will also play a role in contributing to the funds needed for the total project.

The DRMP project will target three value chains: dairy, red meat and poultry. Three chains that deliver animal-source food that is considered to be crucial for the food and nutritional security of the country. The objective is to improve productivity, market participation, and resilience of small-holder farmers and agro-entrepreneurs operating in the selected livestock systems and value chains in target areas. Figure 1 presents an overview of the main project activities within the DRMP project. Resilience will be strengthened by mainstreaming climate smart agriculture (CSA) practices across investments, and promoting the uptake of livestock insurance to protect the farmers against asset losses. The targeted species that are part of the value chains mentioned are cattle, buffalo, goats, sheep and chicken. considered strategic for both food security/nutritional supply and for their comparative advantage on the regional markets and associated income generation potential.

Figure 1 shows that producers and producer organizations (PO) are involved in many of the activities within DRMP. The same is true for the Department of Livestock Services (DLS) the department of GoB that is responsible for the development of the livestock sector by improving livelihoods and food security. The main tasks of this organization are extension and support services to the livestock sector.

Figure 1. Overview of project activities and the allocation of activities within links of the value chain



4. Approach and programme of scoping mission

In the preparatory phase the members of the scoping mission had contact with [redacted] (Netherlands representative at World Bank) and staff members of RIKILT (Part of Wageningen Research providing research and services on food safety), Agriterra, Nuffic and Solidaridad and a limited number of private sector representatives in the Netherlands. During the mission from February 3 until February 13 in 2018 the mission members had interviews with many organizations in Bangladesh representing a broad variety of links within the livestock value chain. The programme during this mission period is listed in appendix 1. Appendix 2 explains the abbreviations of many of the visited organizations and also includes a limited number of other organizations that are active in livestock development.

The results reported in this concept note are largely based on the following sources:

- The project appraisal document of the DRPM project of the World Bank;
- Technical notes³ made by World Bank and added experts during the preparation phase of the DRMP project;
- Interviews held during the scoping mission with actors mentioned in appendix 1 (including Power point presentations and written information provided by the interviewees);
- Stakeholders consultation on realizing the potential of knowledge based partnerships for livestock development in Bangladesh, organized by Solidaridad and attended by many chain actors within the dairy chain in Bangladesh on February 11th, 2018 at A.K.M. Giasudin Milky Conference Hall at Dhaka;
- Report: FAO & New Zealand Agricultural Greenhouse Gas Research Centre 2017. Options for low emission development in the Bangladesh dairy sector – reducing enteric methane for food security and livelihoods. Rome. 34 pp.;
- Many documents that became available during the visits in Bangladesh.

5. Key challenges in livestock production

The challenges are presented in the tables 1, 2 and 3 for the respective three sectors: dairy, red meat and poultry. For each of the challenges mentioned in the tables, the corresponding activities in the DRMP project (called sub-component in DRMP project appraisal) are listed in the last column. This gives an overview which sub-components are involved. See figure 1 for an overview of the sub-components in the DRMP project.

The challenges are grouped in four main categories: (1) sector strategy, (2) regulation and monitoring, (3) farm management and (4) research and education. This makes it easier to understand the main objectives and might create possibilities to combine activities in a later stage. The challenges mentioned below for the poultry and red meat sectors are almost the same themes as the ones mentioned for the dairy sector. The only exceptions to these rules are the challenges in the farm management category. They differ based on differences in the specific characteristics of the three sectors. For the dairy sector fodder, feed rations and livestock services are important. For the red meat sector it is about improving meat yield per animal combined with feeding and livestock services. For poultry it is also about livestock services and next to that about the improvement of contracts between poultry farmers, feed mills and slaughter houses.

³ During the preparation phase of the project World Bank project “Bangladesh Livestock Development-based Dairy Revolution and Meat Production Project” several technical notes were made that present background information about the sectors involved and themes considered to be relevant. All technical notes are dated October 2017.

Table 1. Addressing the main challenges for the dairy sector

Challenge	Main category	Connected to DRPM sub-component
1. Develop future scenarios for dairy farming systems (incl. competition on land and feed resources and cost price impact).	Sector strategy	C1*
2. Develop and implement a joint dairy vision (5 year plan) after establishment of Dairy Development Board (DDB) and establishment of Knowledge Platform, including interventions by chain partners.		C1
3. Develop system to monitor milk quality throughout the dairy chain with a leading role for the milk processors (incl. delivery contracts and collaboration with producer organizations).	Regulation and monitoring	C2, B1
4. Develop monitoring and control system endemic diseases and antibiotics policy.		C2*, A2*
5. MOLF/DLS: shift focus to regulation animal health and food safety; less on service provision about farm management, including AI and paramedical treatments.		C2
6. Increase fodder production and/or find alternative cattle fodder sources.	Farm management	A2
7. Improve feed rations to achieve higher milk production per cow.		A2
8. Improve services and quality of AI, vaccinations and medicines on farms (by private sector) supported by improved regulation and monitoring of the quality by processors and government.		A2, B1
9. Develop breeding strategies and programmes.	Research and education	A2*
10. Organize research in a way that it: <ul style="list-style-type: none"> a. Collaborates with farmers and the private sector⁴ (demand driven); b. Puts more emphasize on applied research. 		C1
11. Add education (on all levels) in practical skills with emphasize on TVET and BSc levels to come to workers that are more rapidly deployable in all parts of livestock sector.		C1, A1

* The indicated DRMP sub-component only covers this challenge partly.

The above table shows some DRMP sub-components in the last column with an asterix(*). These challenges are only partly covered by activities within DRMP that will solve the issue. The further elaboration of DRMP might result in the incorporation of the whole challenge or the LKP may be able to fill this development gap to solve this issue. Based on our observations, these challenges deserve attention in the process of livestock development.

⁴ The private sector encompasses all for-profit businesses that are not owned or operated by the government. In this paper we distinguish between farmers and private sector. The private sector comprises in this paper: suppliers of goods and knowledge, and processors of milk, meat and eggs.

Table 2. Addressing the main challenges for the red meat sector

Challenge	Main category	Connected to DRPM sub-component
1. Develop future scenarios red meat farming systems (incl. supply of feed resources and cost price impact).	Sector strategy	C1*
2. Develop and implement a joint red meat vision (5 year plan) in collaboration with private sector including interventions by chain partners and establishment of Knowledge Platform.		C1
3. Develop system to monitor meat quality throughout the meat chain with leading role for feed mills and slaughter houses (incl. delivery contracts and collaboration with producer organizations).	Regulation and monitoring	C2, B1
4. Develop monitoring and control system for endemic diseases and antibiotics policy.		C2*, A2*
5. MOLF/DLS: shift focus to regulation animal health and food safety; less on service provision outside the field of regulation.		C2
6. Improve services of feed mills, vaccinations and medicines on farms including the quality of all.	Farm management	A2, B1
7. Increase meat yield per animal.		A2
8. Organize research in a way that it: <ul style="list-style-type: none"> a. Collaborates with private sector and farmers (demand driven); b. Puts more emphasize on applied research. 	Research and education	C1
9. Add education (on all levels) in practical skills with emphasize on TVET and BSc levels to come to workers that are more rapidly deployable in all parts of livestock sector.		C1, A1

* The indicated DRMP sub-component only covers this challenge partly.

Table 3. Addressing the main challenges for the poultry sector

Challenge	Main category	Connected to DRPM sub-component
1. Develop future scenarios poultry farming systems (incl. supply of feed resources and cost price impact).	Sector strategy	C1*
2. Develop and implement a joint poultry vision (5 year plan) in collaboration with private sector including interventions by chain partners and establishment of Knowledge Platform.		C1
3. Develop system to monitor meat quality throughout the poultry chain with leading role for feed mills and slaughter houses (incl. delivery contracts and collaboration with producer organizations).	Regulation and monitoring	C2, B1
4. Develop monitoring and control system endemic diseases and antibiotics policy.		C2*, A2*
5. MOLF/DLS: shift focus to regulation animal health and food safety; less on service provision outside the field of regulation.		C2
6. Improve services of feed mills, vaccinations and medicines on farms including the quality of all.	Farm management	A2, B1
7. Improve contracts between feed mills, farmers and slaughter houses to reduce volatility in margins of farmers.		B1
8. Organize research in a way that it: <ul style="list-style-type: none"> a. Collaborates with private sector and farmers (demand driven); b. Puts more emphasize on applied research. 	Research and education	C1
9. Add education (on all levels) in practical skills with emphasize on TVET and BSc levels to come to workers that are more rapidly deployable in all parts of livestock sector.		C1, A1

* The indicated DRMP sub-component only covers this challenge partly.

6. How to come to focus?

6.1. Criteria for selection of interventions

Chapter 5 describes many challenges. Each of these challenges can be elaborated into one or more interventions that will contribute to transform the challenge into solutions or best practices. We suggest the next criteria to support the decision makers in the selection of interventions within the LKP:

1. The intervention is aligned with the sub-components selected within DRMP or fills a crucial gap in the DRMP;
2. The intervention enhances or speeds up the development desired by the GoB;
3. The Netherlands can offer proven expertise on the intervention;
4. The intervention strengthens the regulatory role of government institutions and/or supports private sector in building a stronger and country wide chain;
5. The intervention leads to long term capacity building for a better facilitation role of government policy staff within livestock chains and/or better production and quality performances within the chain;
6. The intervention contributes to more skilled staff in regulation by GoB and in building better commercial and knowledge relationships between chain actors. It will enhance the roles of GoB and private sector to support livestock development;
7. Experts from Bangladesh and the Netherlands agree that collaboration on this intervention will speed up the development process.

6.2. Opportunities and risks

The next lists with opportunities and risks will help to better understand the perspectives of the LKP and the potential to make the LKP to a success.

Opportunities

- a. Strong public sector support for the white revolution to increase milk production and higher quality milk supply to customers;
- b. The DRMP project creates an enormous momentum towards change in the sectors involved;
- c. Many actors are in favour of sector development;
- d. Lessons learned from the development of rice and poultry production in Bangladesh can be used for the next steps in the development of the livestock sector;
- e. The establishment of producer organizations and regional service providers for dairy farmers by NGOs in the past decade.

Lessons learned under d and e above should pave the road towards future efforts to accelerate livestock development.

Risks

- a. The increase in production of the livestock sector in an environment with poor biosecurity and lack of feed may result in high use of drugs and poor food security.
This situation has grown in the Bangladesh poultry sector in the past decades and there is a risk that this might happen again when cattle production will be increased. This is the reason to emphasize strongly on improved production circumstances for livestock as key condition for growth in production: fodder supply, feeding, hygiene, health and animal welfare. Veterinary services should focus on prevention instead of cure.
- b. Several interviewees expressed that many good plans of GoB did not reach the stage of implementation.
This means that there is a risk that existing or new regulation and also challenging future visions on livestock will be very hard to implement. Regulation therefore should be combined with monitoring and enforcement. The implementation of future visions needs responsible chain actors who have the willingness and capacity to implement the changes that are needed. This is also the reason for strong emphasize on collaboration between chain actors.
- c. Transformation of DLS to more emphasize on regulation policy and outsourcing farmer advisory and service tasks to private sector.
This transformation houses the risk of lack of support throughout the organization, lack of skills for new roles or acceptance of new roles.
- d. High cost price of milk, meat and eggs.
The current cost prices of milk and meat are higher than prices on the international market. Imports of these products may frustrate the domestic production since processors may prefer to use imported milk and meat.
- e. Processors can refuse to accept milk.
Current milk collection systems do not ensure farmers that the milk will be collected on a daily basis. Milk contracts covering volumes, prices and quality could improve this situation.
- f. Large scale IT initiative(s) to monitor all farms or all animals are not yet in place.
It will take time to organize these systems in such a way that they will deliver what is desired.

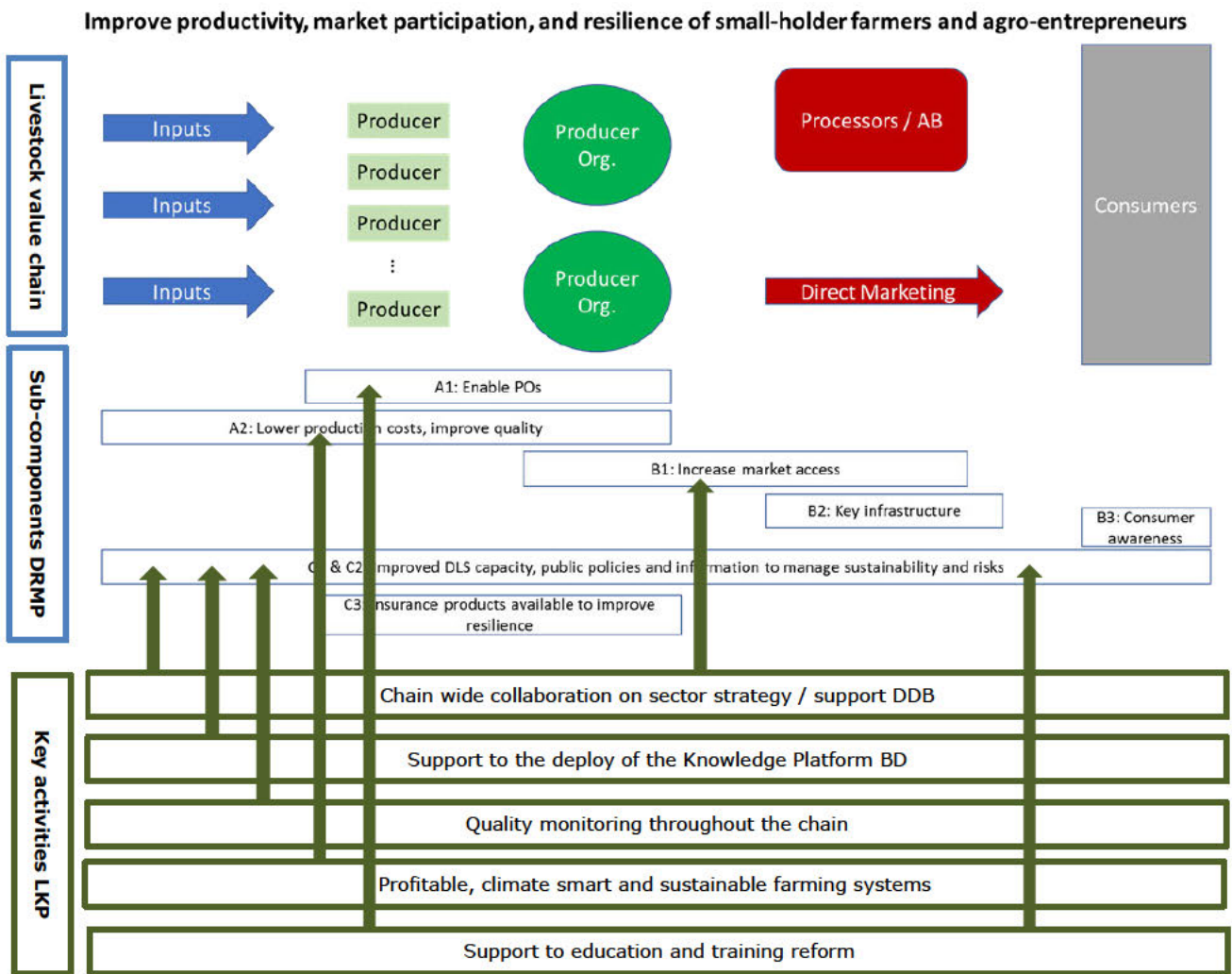
7. Recommended key activities LKP

Based on the challenges addressed in chapter 5 and the screening criteria in chapter 6 we suggest the next key activities to be part of the LKP:

- 1. Chain-wide collaboration on sector strategy development and governance, incl. support to Dairy Development Board:**
 - a. Future farming systems (scenario's), including among others fodder availability, farm size, cost price of milk and crucial change processes;
 - b. Sector vision, including key interventions, roles of stakeholders and road map;
 - c. Responsibilities of private and government sectors, based on a sector vision that matches with organizational reforms and capacity building;
 - d. Collaboration on sector level: research, knowledge dissemination, education and regulation (among others: producer organizations and contracts with processors).
- 2. Support to the deploy of the Knowledge Platform BD:**
 - a. Develop the right governance for the Knowledge Platform in collaboration with all chain actors involved, including the strategy of the platform;
 - b. Develop portfolio: support to policy development, advisory services, innovations, research agenda, design of information systems, education and training;
 - c. Initiating demand driven research activities, including applied research and innovation agenda.
 - d. Support the resulting restructuring of the R&D infrastructure and knowledge dissemination, including collaboration between research institutes, private sector and public and private advisory services.
- 3. Quality monitoring throughout the chain (from suppliers of fodder and feed to consumers):**
 - a. Feed quality monitoring including independent laboratory facilities;
 - b. Quality based payment of farmers (milk and meat), including independent laboratory facilities and payment system;
 - c. Food safety monitoring, among others to build more trust in livestock products;
 - d. Bio security monitoring (incl. One Health approach) to limit risks of spreading diseases and excessive use of drugs and to decrease disease prevalence.
- 4. Profitable, climate smart and sustainable farming systems:**
 - a. Fodder cultivation and supply, among others new fodder sources and cultivation of fodder crops that offer high quality;
 - b. Feed rations to enable higher production per cow of milk and meat;
 - c. Health, fertility and animal welfare to create a healthy environment for highly productive animals;
 - d. Climate smart best practices in which the aforementioned 4a to 4c play a crucial role.
 - e. Well-equipped local livestock service provision organizations with well-educated and customer oriented staff, preferably organized by dairy processors and producer organizations to focus on efficiency and quality of farms and chains. This is necessary to facilitate the aforementioned improvements in farming systems.
- 5. Support to education and training reform**
 - a. More education on applied skills and practical training on all levels of education in livestock, to fulfil the great need of the private sector (among others processors, feed mills, AI organizations and suppliers) for skilled workers;
 - b. Emphasize on improvement of TVET and BSc education to supply workers that are more rapidly deployable in all parts of livestock sector;
 - c. On the job trainings for present workers in all segments of the livestock chain, including DLS and upgrading of Farmer Field School approach.

Figure 2 shows schematically how the above activities are related to the planned activities of DRMP that were already explained in chapter 3.

Figure 2. Connections between key activities LKP and activities in sub-components of DRMP



This figure shows that the defined key activities are strongly focussed on the components C1 (capacity development and knowledge platform) and C2 (food safety and public health). Next to that on A2 (lowering production costs and improve milk quality) and A1 (support to producer organizations), mainly focussed on best farming practices, craftsmanship and entrepreneurship. Finally also some activities on milk contracts between producers and processors that belong to B1 (increase market access).

8. Institutional arrangement of LKP

The first step in building the LKP will be to identify partners that are willing to share responsibilities in the improvement of the livestock sectors. Shared ambitions in the area of challenges and activities mentioned in chapter 7, and the strength to contribute to the changes needed are criteria that should play a crucial role in the selection of partners that are invited to participate in the LKP. After a group of participants is formed, the next step will be to develop an institutional arrangement of the LKP. During the discussions about this arrangement the scoping mission had with Bangladesh stakeholders much emphasis was put on active involvement of the private sector. Next to the government sector, NGO's, research and possible other partners a leading role for the private sector was considered key to improve collaboration within the chain.

8.1. Multi stakeholder approach

In the construction of the LKP activities it will be useful to use a multi stakeholder approach. Stakeholders are invited and based on their shared ambitions and strengths they will take decisions about the construction of the institutional arrangement of the LKP. The same approach could also be used to build the Dairy Development Board and the Knowledge Platform. All these organizations are expected to be multi-actor organizations. The main stakeholders in these organizations will be: farmers (including producer organizations), processors (milk, meat and eggs), livestock service providers (self-employed or employee), suppliers (among others feed mills, pharmaceutical companies, AI organizations, hatcheries), finance organizations, government (regulation and service provision), research and innovation institutes, education and training institutes. Wholesalers and retailers should also be considered as partners in livestock development. One of the first steps in the process to come to institutional arrangements for Dairy Development Board, Knowledge Platform and LKP will be to identify the partners that have the ambition to be part of these types of partnerships.

In the initial phase of all these organizations, it is important to have skilled facilitators of group designing processes available that will be able to manage the different stages of the multi stakeholder process. In the first stages the representatives of stakeholders or the preparatory team members have to find out which partners are relevant and how to come to collaboration concepts. In the later stages they have to define the actions or interventions that will be taken by the different partners within the collaborating group of stakeholders.

8.2. Arrangement of LKP

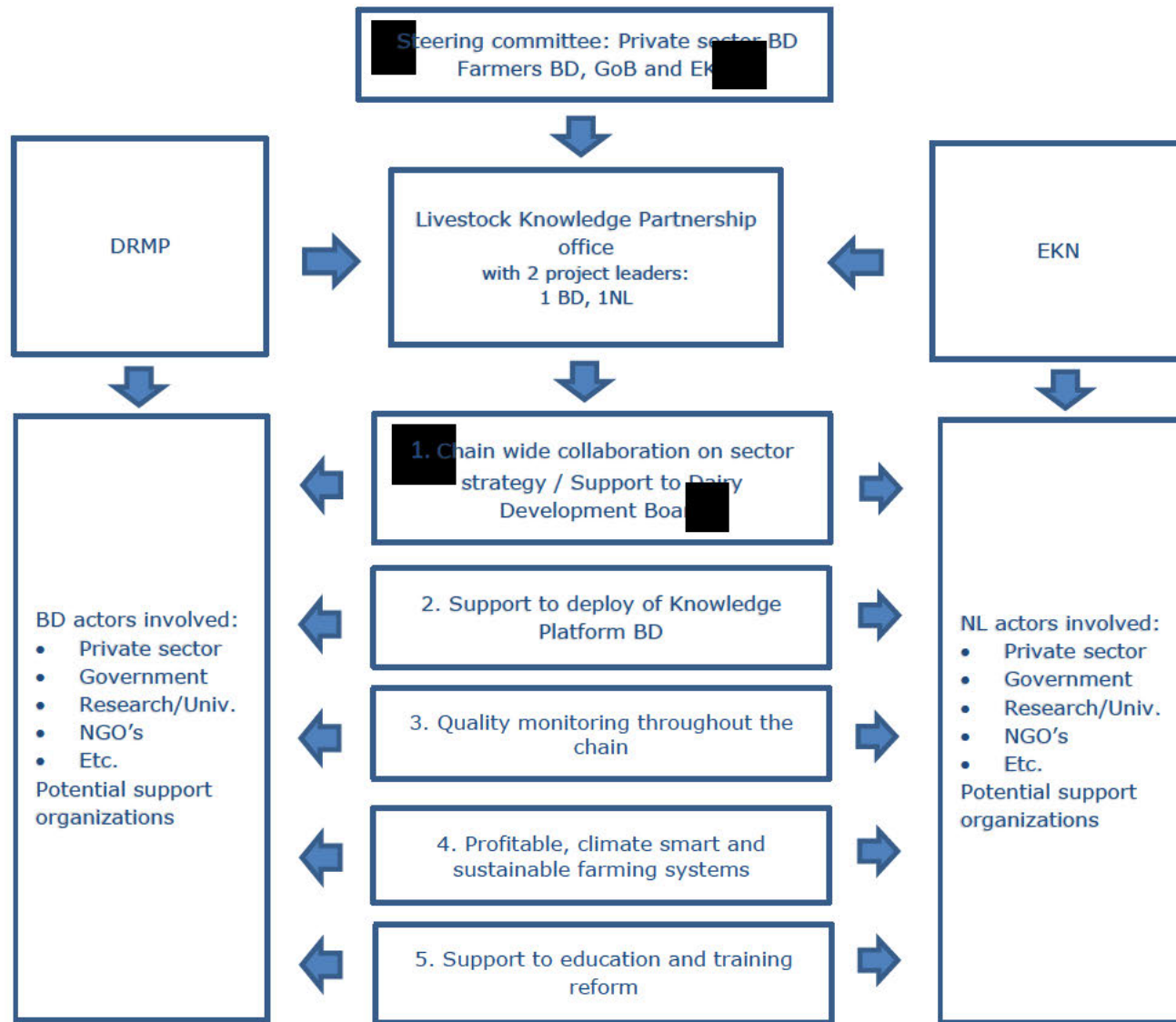
To come to the institutional arrangement of a LKP we suggest to use the multi stakeholder approach. Figure 3 reflects a possible set-up of the arrangement of a possible LKP without the preceding multi stakeholder approach. This organogram is designed for a dairy sector based LKP. It can however also be read as representing the entire livestock sector. In this organogram, the LKP is guided by a steering committee formed by stakeholders (see aforementioned list), including members of the expected co-financers EKN and GoB. In the initial phase the participants can decide whether or not to involve all the organizations meant - including the WB - in the steering committee.

After the selection of the stakeholder representatives in the steering committee of the LKP, they should define their common own goals in the field of livestock development and activities to achieve the goals. This will most likely be the goals and activities listed in chapter 7.

The heart of the executive part of the LKP will be a small LKP 'office' with a core team consisting of two project leaders: one representing the Bangladesh partners on the demand side and another one representing the Dutch partners on the supply side. These project leaders match demand and supply of services and knowledge. The project leaders will also install teams to execute projects on the five identified key activities (or underlying themes) which are also listed in the organogram. They will be involved in the recruitment of Bangladesh and Dutch experts who will be members of these teams. The LKP, in this case, consists of a series of projects performed by experts from the two countries. The members in the teams will be recruited from organizations that have the expertise needed to achieve the project goals. These experts may originate from government organizations, research, consultants, universities, private sector, etc. in both countries. They participate in the project LKP during an agreed time span.

There should be a close relationship between the LKP 'office' and the DRMP project, to align LKP activities with the implementation of DRMP projects. This can e.g. be established through selecting a Bangladesh project leader who is also connected to, or part of the DRMP project.

Figure 3. Draft organogram for a Livestock Knowledge Partnership



All arrows are shown as one direction arrows, this is just to indicate the initial course of action. During the implementation phase all linkages are expected to work both ways to take advantage of the exchange of needs, knowledge and experiences of all partners.

8.3. Possible partners involved in LKP activities

Table 4 gives indications for possible partners that may have potential to collaborate on the key activities and the subthemes mentioned in chapter 7. These are just indications of the type of partners that could be involved. Because of the preparatory character of this concept note, none of these partners is yet contacted about their specific skills for the themes listed, their willingness or financial resources, and/or their commitment. The Dutch organizations suggested are recommended by the mission to share their experiences with Bangladesh counterparts. Since the mission has made clear that the further development of the private sector receives a high priority, extra attention is given to Dutch private sector organizations that are involved in services towards the livestock sector.

A group of organizations, that needs special attention, are the NGOs. The mission had meetings with the NGOs Solidaridad, BRAC, Care and SNV and also with representatives of Oxfam and Heifer International during a workshop. Most of these organizations have built a track record in livestock development in Bangladesh and often also in livestock development programs in other countries. In the past decades they have delivered some successful examples of collaboration between farmers, producer organizations and livestock service providers; and also developed approaches that stimulated woman to participate in dairy farms and livestock provision services. These experiences match very well with the DRMP ambitions on producer organizations, commercial service providers, better milk contracts and the involvement of more women and youth in the livestock sectors. The challenge will be to use these experiences to reach many more milk producers and processors all over the country.

Table 4 is a preliminary list only meant to show a longlist of organizations. By the time the preparatory team of stakeholders or the steering committee or the project leaders within LKP have made their more detailed plans for the LKP, they can select the organizations that are needed to successfully execute these plans. In that stage they have to select and contact the intended partners and come to agreements about their contribution and the associated conditions.

Comments on Dutch partners

Table 4 lists many Dutch organizations that are involved in livestock development. The search for matching partners within a LKP will require a tailor made search process that need good facilitation from independent facilitators from e.g. consultants, Wageningen Research, EKN or NGOs. The organizations mentioned in table 4 have the potential to offer support on this road to the tailor made LKP. It will require next steps (listed in chapter 9) to come to a selection of suitable partners that will have added value for the required development in Bangladesh.

The next list contains some extra information about a limited group Dutch actors in the livestock sector.

- Processors in the Netherlands: FrieslandCampina is the major cooperative dairy processor with long-term experience in processing and dairy development in many countries. Next to this processor the Netherlands is home of many smaller dairy processors and suppliers of processing companies. In meat processing Vion Food Group and Van Drie Group are large meat companies; next to these two there are many medium sized specialized slaughter houses for beef, pork and poultry meat.
- Feed companies in the Netherlands: the Netherlands is home of many feed companies among others two large cooperative feed companies (Agrifirm and ForFarmers) and one strong internationally oriented feed company (De Heus).
- Research institutes: in the Netherlands many research institutes operate under the umbrella organisations Wageningen University & Research (WUR). Wageningen Research is experienced in different parts of the food chain: among others animal production (Wageningen Livestock Research), animal health (Wageningen Bioveterinary Research), plant production (Wageningen Plant Research), processing (Wageningen Food and Biobased Research), quality control (RIKILT) and development innovation (Wageningen Centre for Development Innovation).
Next to WUR there are numerous other specialized organisations on among others feed research, dairy and meat processing and animal health. And next to WUR there are four Universities of Applied Sciences (mainly focussing on BSc degree) and there is one specialized faculty in Animal Health at the University of Utrecht. All these universities have also research staff next to their education activities.

- Private companies: in the table only a limited number of mainly large companies are listed. Next to these companies numerous smaller and/or more specialized companies are available for many fields of interest within the livestock sector.

Table 4. Possible partners from Bangladesh and the Netherlands who could add to the execution of LKP

Key activity / Theme	Possible BD Partner*	Possible NL Partner*
1. Chain-wide collaboration on sector strategy development and governance, incl. support to Dairy Development Board:		
a. Future farming systems (scenario's)	BLRI DLS NGOs	Wageningen Livestock Research Consultants Processors
b. Sector vision	Farmers Processors Suppliers DLS	LTO / Zuivel NL / NZO Wageningen Research NGOs Agriterra
c. Responsibilities of private and government sectors	DLS MOHFW NGOs	Government authorities (NVWA) Wageningen Research/RIKILT Processors Qlip Quality Assurance
d. Collaboration on sector level: research, knowledge dissemination, education and regulation (among others producer organizations and contracts with processors)	DLS BLRI Universities TVET schools Livestock service providers	LTO / Zuivel NL / NZO Wageningen Research Processors Qlip Quality Assurance Advisory services/Consultants Universities
2. Support to the deploy of the Knowledge Platform BD:		
a. Develop the right governance for Knowledge Platform, in collaboration with all chain actors involved, including strategy of the platform	Dairy Development Board Chain actors on knowledge BLRI DLS	Zuivel NL Processors Wageningen Centre for Development Innovation
b. Develop portfolio: support to policy development, advisory services, innovations, research agenda, design of information systems, education and training		Wageningen University & Research Consultants
c. Initiating need based research activities		
d. Restructuring of the R&D infrastructure and knowledge dissemination		
3. Quality monitoring throughout the chain (from suppliers of fodder and feed to consumers):		
a. Feed quality monitoring	Feed laboratory	Feed Laboratory

Table 4. Possible partners from Bangladesh and the Netherlands who could add to the execution of LKP

Key activity / Theme	Possible BD Partner*	Possible NL Partner*
b. Quality based payment of farmers (milk and meat)	Processors Farmers Quality authority	Qlip Quality Assurance Processors Agriterra NGOs
c. Food safety monitoring	Authority Laboratory	RIKILT Government authorities (NVWA) Laboratory, incl. suppliers
d. Bio security monitoring (One health approach)	Authorities (Livestock and Health) FAO	Wageningen Bio Veterinary Research GD Animal Health Service Pharma companies
4. Profitable, climate smart and sustainable farming systems:		
a. Fodder cultivation and supply	BLRI DLS Seed companies	Feed companies Wageningen Livestock Research NGOs Advisory services / Training centres Seed companies
b. Feed rations	BLRI DLS Feed companies	Feed laboratories Feed companies Advisory services / Training centres Seed companies
c. Health, fertility and animal welfare	Veterinarians AI organizations Paramedic Service Providers DLS	GD Animal Health Service Wageningen Bio Veterinary Research AI organizations Vets NGOs Advisory services / Training centres Pharma companies
d. Climate smart best practices	NGOs	Wageningen Research Advisory services NGOs
e. Local livestock service provision organizations	Producer organizations NGOs Processors	NGOs Private consultants Advisory services / Training centres

Table 4. Possible partners from Bangladesh and the Netherlands who could add to the execution of LKP

Key activity / Theme	Possible BD Partner*	Possible NL Partner*
5. Support to education reform		
a. More education on applied skills and practical training	TVETs	Nuffic
b. Emphasize on TVET and BSc to supply workers that are more rapidly deployable in all parts of livestock sector	Training institutes DLS Universities	Advisory services / Training centres Universities (also Universities of Applied Sciences)
d. On the job trainings for present workers in all segments of the livestock chain, including DLS and upgrading of Farmer Field School approach		Agritererra NGOs

* All partners are listed in random order

9. Next steps

This paper describes key challenges and key interventions that could be the backbone of a LKP between Bangladesh and the Netherlands. Further opportunities and risks are listed to make clear that the mission has also recognized positive and negative drivers that may influence the success of a partnership. Thereafter the mission presented an institutional framework with organogram and potential partners that could contribute to the LKP. This information is presented to support the first steps in a decision making process with regard to a knowledge partnership. The mission considers the next steps as a road map for further decision making:

1. Decision about continuation of the process towards a LKN, based on this paper with recommendations.
The decision makers who are involved will be EKN, GoB and the WB k (go/no go for next steps).
2. Further elaboration of the LKP based on the interests of the partners to be involved.
In this phase partners can adjust the focus themes and make lists of more clearly defined objectives and activities.
3. Elaboration on objectives to define targets, activities and desired budgets.
In this elaboration process the width of the scope of LKP, the duration of the project, activities in the execution phase, desired budgets and financing will be topics that will result in a first draft of a project appraisal of the LKP.
4. Invitations to partners to join the partnership and contribute to finance.
Partners will be invited to take part and funds will be raised to finance the activities of the partners.
5. More detailed project appraisal for the execution of the partnership.
In the last preparatory phase the objectives, activities, executing partners and available funds will be more clearly defined.

Appendix 1. Program of the Scoping Mission to investigate the potential of a Knowledge Partnership on Livestock Development in Bangladesh

Date	Time	Activity*
Sunday 04.02.2018	13.30-14.00	Briefing at EKN
	14.00-15.00	Program schedule review and finalization
	15.00-17.00	Meeting with DLS
Monday 05.02.2017	10:00-12.00	Meeting with DGs of DLS and DRMP
	12:30-14.00	Meeting with ██████████ World Bank
	15:00-16.00	Meeting with MOFL
Tuesday 06.02.2018	09.30-10.30	Visiting Officers Training Institute, Savar
	10.30-11.30	Visiting Govt. Dairy Farm and AI stud at Savar
	12.00-14.00	Meeting with DG, BLRI and field excursion
	15.00-16.00	Visit dairy farm
	16.00-17.00	Visit poultry farm
Wednesday 07.02.2018	10.00-11.00	Visiting Veterinary Training Institute, Khagdahar, Mymensingh
	12.00-14.00	Meet BAU and BAURES
	14.30-17.00	Visit some livestock farm and homestead areas around Mymensingh
Thursday 08.02.2018	08.30-9.30	Stop at Valuka and Discuss with DLS field staff – ULO, VS, VFA
	10.00-11.00	Visit Lalteer AI organization and bull stud at Valuka, Mymensingh
Friday 09.02.2018	08.00-14.00	Visit different market places for meat, milk, eggs, live animals and birds and a dairy farm in Dhaka
	15.00-16.00	ICCO about PROOFS project experiences
Saturday 10.02.2018	09.00-10.00	Meeting with CARE along with Krishi Uthsho (Anowarul Hoque, Maruf Azam)
	10.30-11.30	Meeting with ██████████ ACI
	11.45-12.45	Meeting with ██████████ BRAC Dairy Ltd.,
	13.00-15.00	PRAN Dairy Ltd. Office at Pragati Sharani (middle Badda) , ██████████
	16.00-17.00	Meeting with Solidaridad, ██████████ team
Sunday 11.02.2018	09:30-13:00	Discussion with a group of farmers and service providers involved in livestock management First part to discuss experiences, challenges, and second half to discuss in groups possible solutions and plenary presentation
	14:00 –15:30	Roundtable discussion with development partners based on provocative statements about the development of the dairy sector in Bangladesh
	16:00 – 17:00	Roundtable ICT/Web/App etc. based knowledge management (BIID, mPower, Miaki)
Monday 12.02.2018	08.30-9.30	Meeting with FAO
	10.00-11.00	Meeting with BPIA
	11.30-12.30	Meeting with AH CAB
	14.00-15.00	Feed Industry Association of Bangladesh (FIAB)
	15.30-16.30	National Dairy Development Forum
Tuesday 13.02.2018	09.00-11.00	Summarizing and sharing with DRMP
	12.00-13.00	Debriefing with government (MOFL/DLS)
	14.30-15.00	Debriefing with WB (over phone)
	15.00-16.30	Debriefing with EKN

*See appendix 2 for explanation of organization abbreviations

Appendix 2. Limited list of organizations involved in livestock development in Bangladesh

This list is a selection of the organisations that were mentioned during the mission. The list is not complete. It is the result of our first encounter with livestock development in Bangladesh and may serve as a list to build on for organisations who will deploy follow up activities to come to a Livestock Knowledge Partnership.

Abbreviation	Full name	Met during scoping mission
AHCAB	Animal Health Companies Association of Bangladesh	X
BAU	Bangladesh Agricultural University (at Mymensing)	X
BAURES	Bangladesh Agricultural University Research System	X
BAB	Breeders Association in Bangladesh (Poultry)	
BDFA	Bangladesh Dairy Farmers Association	
BEPA	Bangladesh Egg Producers Association	
BLRI	Bangladesh Livestock Research Institute	X
BPBA	Bangladesh Poultry Breeders Association	
BPIAB	Bangladesh Poultry Industries Association	X
BVA	Bangladesh Veterinary Association	
CVASU	Chittagong Veterinary and Animal Science University	
DIAB	Dairy Industries Association in Bangladesh	
DLS	Department of Livestock Services	X
DOE	Department of Environment	
DRMP	Dairy Revolution and Meat Production (project organization of DLS)	X
FAO	Food and Agriculture Organization of the United Nations Organization	X
FIAB	Feed Industries Association of Bangladesh	X
GoB	Government of Bangladesh	X
IDA	International Development Association	
IFPRI	International Food for Policy Research Institute	
INAPH	Information Network for Animal Productivity and Health	
MOF	Ministry of Finance	
MOFL	Ministry of Fisheries and Livestock	X
MOHFW	Ministry of Health and Family Welfare	
MOPA	Ministry of Public Administration	
NGO/INGO	Non-Governmental Organization	X*
NDDF	National Dairy Development Forum	X
PO	Producer Organizations	
WB	World Bank	X

*NGOs met during scoping mission: Solidaridad, Care and BRAC about their experience with dairy production; ICCO about crop production; SNV about climate smart agriculture