Phase 1 Scoping visit - strategic collaboration NIFTEM & WUR

Scoping visit WUR to NIFTEM (May 15th to 17th 2019)

Joost Snels, Eelke Westra, Swathi Vurrakula

WAGENINGEN
UNIVERSITY & RESEARCH

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Abbreviations

BMC	Business Model Canvas
CoE	Centre of Excellence
CosE	Centres of Excellence
CRO	Contract Research Organisation
FSSAI	Food Safety and Standards Authority of India
INR	Indian rupees
IPR	Intellectual Property Rights
MOFPI	Indian Ministry of Food Processing Industries
NDA	Non-Disclosure Agreements
NIFTEM	National Institute of Food Technology Entrepreneurship and Management
PPP	Public Private Partnership
WFBR	Wageningen Food and Biobased Research
WUR	Wageningen University and Research

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Preface

Wageningen University and Research (WUR) would like to thank Honourable Vice Chancellor of the National Institute of Food Technology Entrepreneurship and Management (NIFTEM), Dr. Chindi Vasudevappa for his consistent support and effective discussions in setting up this collaboration. His personal invitation to industry members to attend the second day of workshop has resulted in industry members turning up for the workshop and thereby leading to our fruitful discussions on industry-needs.

We would like to thank Dr. J.S. Rana (Registrar, NIFTEM), Dr. Chakkarvathi Saravanan (Assistant Prof, NIFTEM) and Dr. Ashutosh Upadhyay (Prof, NIFTEM) and Dr. Anupama Panghal (Assistant Prof, NIFTEM) for their guidance and coordination leading to the scoping visit.

We also thank the entire staff of NIFTEM for actively participating in the different workshops and discussion sessions conducted over the three days and to the operational staff for making our stay comfortable at the International Guest House of NIFTEM.

Last but not the least, we thank Dr. Gerhard de Ruiter (Business Unit Manager, Fresh Food Chains, Wageningen Food and Biobased Research (WFBR)), Dr. Henk Wensink (R&D Manager, Food Informatics & Supply Chain Development, WFBR), Dr. Nicole Koenderink (R&D Manager, Post-Harvest Technology, WFBR) and Monika Verma (Scientific Researcher, Wageningen Economic Research) for their review of this report.

Summary

This study is performed in the period of May 2019 until July 2019 by researchers of Wageningen Food and Biobased Research (WFBR) in an objective and independent manner. The results of this study are written down in this report that has been prepared by WFBR as a summation of their three day visit to the National Institute of Food Technology Entrepreneurship and Management (NIFTEM) in May 2019. This was a so-called 'Scoping Visit' commissioned and financed by NIFTEM for WFBR to scope out the possibilities of collaboration and feasibility of setting up Centres of Excellence (CsoE) in the following two focal topics:

1. Food supply chain innovations - Innovative and of Global Standards
2. Greening of the food sector - Waste and by-product management

After conducting three days of workshops and interactive discussions with NIFTEM management, staff and Indian industry players, it was clear that NIFTEM wishes to strengthen its industry ties and conduct industry-driven contract research in addition to its current strengths in teaching and fundamental research. This requires a transition towards a Contract Research Organisation (CRO) within in a Centre of Excellence (CoE) framework.

For a successful transition to a CRO, NIFTEM must focus mainly on the impact it has on their personnel, organisation and funding in this transition toward doing applied contract research. In the process of organising this, NIFTEM will be able to excel on the focal topics. So, the needed change is not in establishing and constructing two separate Centres of Excellence. It is in transforming NIFTEM (partly) to a CRO that moves NIFTEM, together with WUR, towards excellence on the two focal topics and operationalized in executing industry-driven contract research (= the so-called CoE framework).

The aim of the (partly) organisational transition of NIFTEM towards a CRO is to strengthen NIFTEM's programs in "Research" and "Value Creation" by conducting industry driven applied research in a contract research format. To strengthen this transitions NIFTEM wants to build on WFBR's experience and know-how. This collaboration between NIFTEM and WFBR also gives WUR footing in India and the chance to learn from the complementary expertise of NIFTEM in meeting the specific challenges of the Indian food industry and to gain revenues through the joint execution of contract research projects.

A phased transition for the CRO along with the necessary activities and resources for this transition have been laid out in the report. This report is to serve as the basis for discussions between NIFTEM and WUR for Phase 2 collaboration, which is to be mutually discussed, adjusted and agreed upon.

***Please note* that the proposed 'next steps', described in this report as Phase 2a, Phase 2b and Phase 3, are based on the findings of Phase 1 (= outcome of the scoping mission) and proposed by Wageningen team as the most applicable and suitable way for NIFTEM and WUR to go forward in their ambition to assess the possibilities of collaboration and the feasibility of setting up a 'NIFTEM CRO' within a CoE framework. The results of Phase 1 presented in this report are to be used as input for further discussion within the decision-making process between NIFTEM and WUR/WFBR on what the next steps should actually be and how the cooperation should look like. The decision-making process itself is not part of this report. The outcomes of the decision-making process may be different than the possibilities mentioned in this report.**

1 Introduction

Wageningen University & Research (WUR) has been discussing with the Indian Ministry of Food Processing Industries (MOFPI) about possibilities for collaboration. This process started after the visit of Mrs. Harsimrat Kaur Badal (Minister of Food Processing, Government of India) on 5th September 2018 to Wageningen campus in the presence of Mrs. Louise Fresco (President of the Executive Board, WUR) and Mr. Raoul Bino (Managing Director, Agrotechnology and Food Sciences Group, WUR).

From these discussions it was clear that MOFPI intends to setup a collaboration between WUR and the National Institute of Food Technology Entrepreneurship & Management (NIFTEM), an autonomous institute under MOFPI[1].

Wageningen Food and Biobased Research (WFBR) is one of the research institutes within WUR whose area and expertise of work overlaps with that of NIFTEM. Therefore, WFBR has been selected as a strategic partner for NIFTEM in starting up a concrete collaboration between WUR and NIFTEM.

It was proposed by NIFTEM that in the form of two joint Centres of Excellence (CsoE) potential areas of collaboration could be:

1. Food Supply Chain solutions - Innovative and of Global Standards
2. Greening of Food Sector - Waste and By-product Management

1.1 Objectives and outline of the report

WFBR proposed to start with a Phase 1 "Scoping visit" to assess the possibilities of collaboration and the feasibility of setting up the envisioned Centres of Excellence (CsoE). Based on this detailed report of the scoping visit prepared by WFBR, if mutually agreed upon, the intention is to move on to further phases of the collaboration roadmap.

This study is performed in the period of May 2019 until July 2019 by researchers of Wageningen Food & Biobased Research (WFBR) in an objective and independent manner. The results of this study are written down in this report that has been prepared by WFBR as a summation of their three day visit to NIFTEM in May 2019. This was a so-called 'Scoping Visit' commissioned and financed by NIFTEM for WFBR to scope out the possibilities of collaboration and feasibility of setting up CsoE.

Chapter 2 of this document summarizes the findings of the scoping visit (also known as Phase 1) undertaken between 15-17 May 2019 by WFBR, represented by Eelke Westra, Joost Snels and Swathi Vurrakula.

Chapters 3 to 5 contain the advice of WFBR for the next phases of the project.

More specifically, Chapter 3 describes, based on the findings of the scoping mission, the needed transition of NIFTEM towards a (partly) Contract Research Organisation in their ambition to become excellent on both the topics Food Supply Chain solutions - Innovative and of Global Standards and Greening of Food Sector - Waste and By-product Management. In Chapters 4 a proposal of how NIFTEM could make the transition towards a Contract Research Organisation is explained in more detail. Chapter 5 elaborates on the possible activities and time lines for both the suggested transition of NIFTEM towards a (partly) Contract Research Organisation and the collaboration between NIFTEM and WUR / WFBR to strengthen this transition. The report ends with conclusions in Chapter 6.

[1] http://www.niftem.ac.in/site/niftem_home.aspx

It should be noted that the proposed 'next steps', described in this report as Phase 2a, Phase 2b and Phase 3, are based on the findings of Phase 1 (= outcome of the scoping mission) and proposed by Wageningen team as the most applicable and suitable why for NIFTEM and WUR to go forward in their ambition to assess the possibilities of collaboration and the feasibility of setting up a 'NIFTEM CRO' within a CoE framework. The results of Phase 1 presented in this report should are to be used as input for further discussion and within the decision-making process between NIFTEM and WUR/WFBR on what the next steps should actually be and how the cooperation should look like. The decision-making process itself is not part of this phase/report. The outcomes of the decision-making process may be different than the possibilities mentioned in this report.

2 Summary of scoping visit

2.1 Introduction

The major part of this project consisted of a so-called scoping visit. The scoping visit was conducted by Eelke Westra, Joost Snels and Swathi Vurrakula from May 15th to May 17th, 2019 at NIFTEM, Sonipat India (see Annex 1 for the program). The Wageningen team felt very welcome during discussions, workshops and interviews conducted over these three days.

Management meeting Day 1, May 15th

Industry meeting Day 2, May 16th

On the first day, interviews and discussions with NIFTEM management and staff were conducted. On the second day, industrial partners were invited to voice their needs, and a consultative workshop with participants from NIFTEM was conducted. On the final day, discussions around the possible set up of the two centres and the resources necessary for such an effective transition have been outlined (see Annex 3).

2.2 The scoping visits findings

A multitude of discussion sessions were conducted over the 3-day scoping visit. The summary of the findings, impressions and observations of the Wageningen team, in relation to the scope of the mission, is presented here:

Overall findings

- The first impression the WFBR staff had of NIFTEM was that it had an enthusiastic group of researchers, staff and management.
- NIFTEM's facilities like the buildings, research equipment, machines, and the like are modern, well maintained, etc., and everyone is open and willing to share ideas.
- Industry is finding their way to NIFTEM and in this regard, the NIFTEM Industrial Forum serves as the starting point for further strengthening their industrial ties.

- The current set up of NIFTEM allows for student internships and for student placements at the industry, start-ups and SME's. Moreover, NIFTEM performs some consultancy work for business partners.
- However, market-oriented research that is driven by industry that needs a contract research format (where the industry pays a part or all the costs of research activities) is currently not being carried out.
- Such a format would facilitate innovation and develop closer collaborations of NIFTEM with the Indian food industry that allow for the timely transfer of latest innovations and thereby promote market competitiveness of collaborating industries.

Management on Day 1 & 2

- It is clearly stated in our discussions with Vice Chancellor Dr. Chindi Vasudevappa, that he wishes to position NIFTEM as the go-to, single-stop institute for the industry when it comes to advanced and applied research in the food sector.
- In this regard, we all agreed that the nature and scope of this collaboration will be customized according to the Indian scenario and a copy-paste of the WUR model for The Netherlands is not suitable for India.

Faculty on Day 1 & 2

- Faculty interviews on day 1 have indicated that most of the time of the faculty members is allocated to teaching and teaching related-activities (such as guiding thesis projects for Bachelor, Master and PhD students) and to a small extent to doing consultancy work for industry.
- The current workload of most faculty members does not allow for them to dedicate substantial time to increasing consultancy work or contract research.
- However, faculty members that have the potential to conduct contract research based on their current research profile, have been identified. If needed they can be trained by WUR to make their transition to conducting contract research.

Industry on Day 2

- The WUR model of doing contract research was shown to industrial stakeholders, and several questions were raised by them regarding their needs. This has shown us that they are quite eager to have them answered through NIFTEM-WUR collaboration.
- Specific projects/issues have been outlined in detail by some of the industries present. This is a good starting point for phase 2. NIFTEM would send out a questionnaire asking them to briefly list their top 2-3 research needs. This list will be shared with WUR (to be added to Annex 4).
- Two companies have already given a list of their research-needs. This may be the basis for a good show-case project for phase 2 (Annex 4).
- Industrial stakeholders have stated their requirements on Non-Disclosure Agreements (NDA) and Intellectual Property Rights (IPR) before they will openly share their current research needs. This is common practice at WFBR and is recommended for the centre to build confidence with the industry and to forge closer relationships for contract research.

Management and Faculty on Day 3 - Final discussions

- With regards to funding of the projects, a 'first-mover' discount could be given to companies. This can either be in the shape of a partly or a fully discounted research project.
- A separate research cell could possibly be established with dedicated staff (could be around 10-20 researchers who are well acquainted with different roles necessary for contract research, such as, project managers, project leaders, business developers et cetera in the long term of around 10 years).
- A transition-fund of around 5-10 crore Indian rupees (INR) is necessary. A detailed budget for this is to be presented in the final report of the scoping visit.

2.3 Aim of collaboration

As stated in the project plan of this project the aim of the collaboration between WFBR and NIFTEM is to strengthen NIFTEM's programs in "Research" and "Value creation" and give footing for WUR in India through customizing WFBR's expertise and know-how in conducting contract research for the Indian food industry.

In this context, support by WFBR is intended to result in the following for NIFTEM:

1. A phased transition of NIFTEM in the short term (over the next 1.5 years) for it to be able to conduct industry-driven contract research projects and thereby possibly earn a part of its industrial R&D project costs in the long term (~10 years).
2. To forge stronger relationships with the Indian food industry by assessing NIFTEM's current legal, financial and organizational systems and adapting them as needed for industry-driven contract research execution in Phase 2.
3. To execute short-term research projects (6-8 months) as 'show-case' projects for industry-driven contract research.
4. To plan collaborative research projects where NIFTEM staff visit WUR and conduct contract research for the Dutch industry (capacity building for NIFTEM staff).
5. For this collaboration to provide a 'networking platform' for the Indian and Dutch industry players.

Foreseen benefits:

- Through this collaboration NIFTEM will benefit from the fact that WUR is a leader in agri-food research and by using NIFTEM's current research facilities for industry driven research.
- WUR will benefit from this collaboration from the complementary expertise of NIFTEM in meeting the specific challenges of the Indian food industry and by gaining revenues through the joint execution of research projects.
- In addition, the collaboration can function as a stepping stone for Dutch and Indian agri-food companies.

2.4 Mission and objective

Based on the interviews, discussions and talks during the scoping mission, the following vision and mission of the NIFTEM-WUR collaboration can be defined:

Mission

Creating impact for the Indian food industry and their customers/consumers.

Objective

Strengthening NIFTEM's programs in Research and Value creation and give footing for WUR in India through exchange of WFBR's know-how and expertise in the agri-food sector via collaboration within the Centre of Excellence framework.

2.5 Business Model Canvas

Related to the mission and vision of this collaboration, this scoping visit has identified the "need gaps" of NIFTEM in the areas of research and value creation using the Business Model Canvas (BMC).

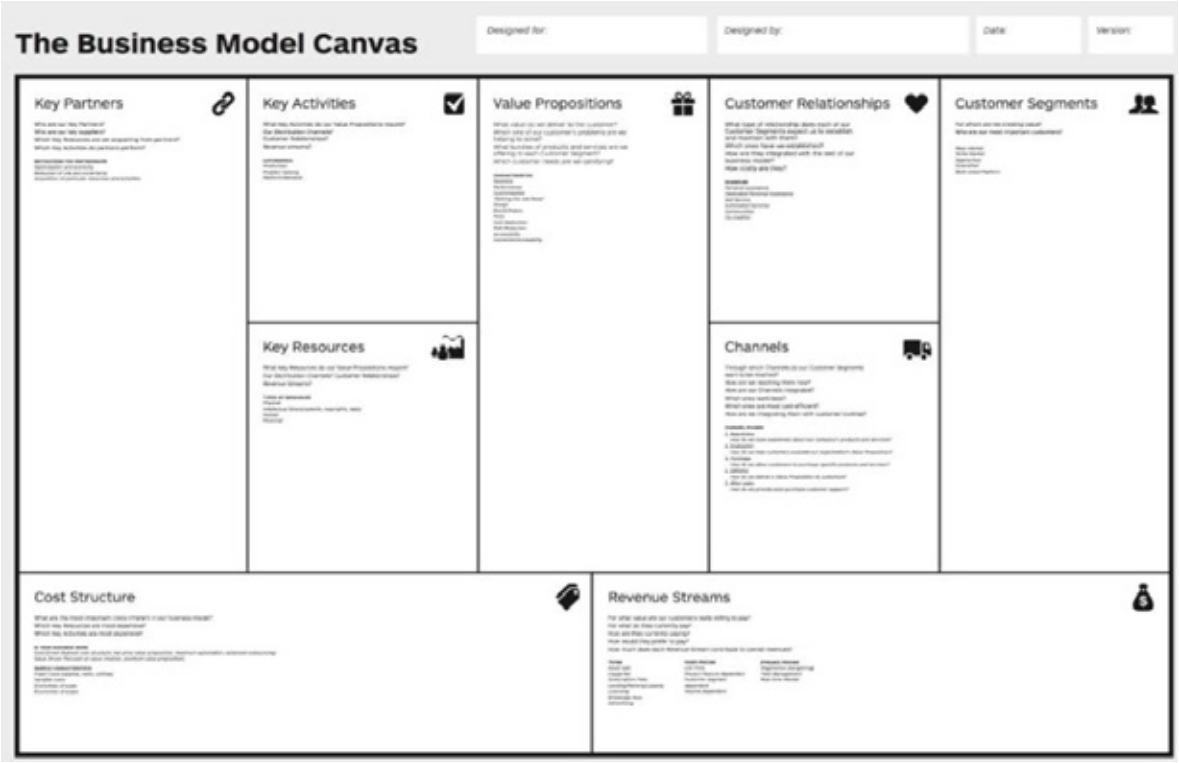

Figure 1: The Business Model Canvas (BMC) ***(Source: https://strategyzer.com/canvas)***

In the BMC nine key drivers of an organisation are identified and visualised:

1. Customer Segments: Who are the customers? What do they Think? See? Feel? Do?
2. Value Propositions: What's compelling about the propositions? Why do customers buy, use?
3. Channels: How are these propositions promoted, sold and delivered? Why? Is it working?
4. Customer Relations: How do you interact with the customer through their 'journey'?
5. Revenue Streams: How does the organisation earn revenue from the value propositions?
6. Key Activities: What uniquely strategic things does the organisation do to deliver its proposition?
7. Key Resources: What unique strategic assets must the organisation have to compete?
8. Key Partnerships: What can the organisation not do so it can focus on its Key Activities?
9. Cost Structure: What are the organisation's major cost drivers? How are they linked to revenue?

The result after the consultative workshop (May 16, 2019) with the relevant NIFTEM staff is the filled in BMC for the two focal topics (see Figure 2).

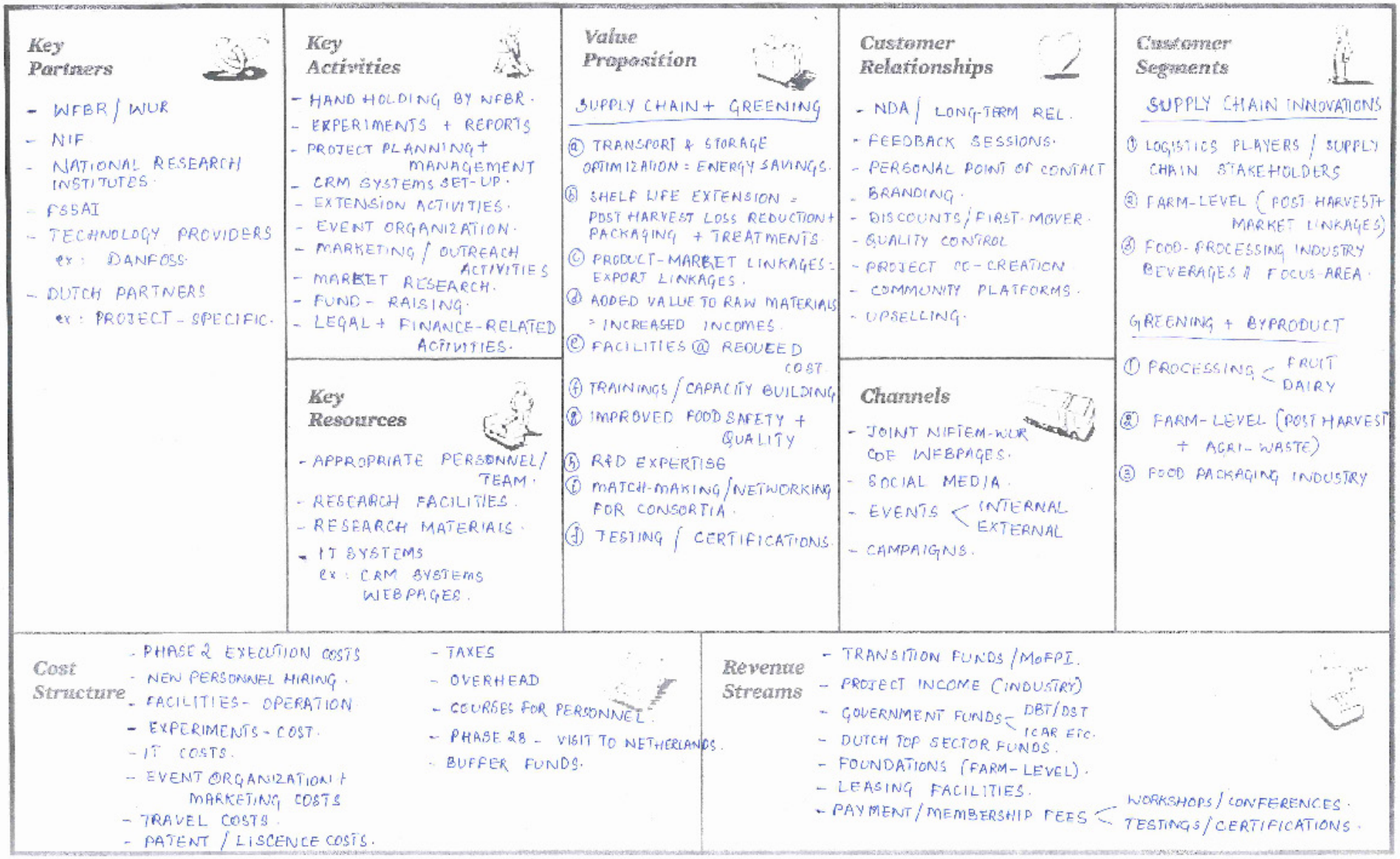

Figure 2: Filled in BMC for the two focal topics of the Centre of Excellence

3 Transition towards a (partly) Contract Research Organisation

3.1 Introduction

The discussion with the industry partners, the interviews and meetings with the NIFTEM staff and the consultative workshop, resulting in the BMC, show the main need gaps, namely the transition towards a Contract Research Organisation. This is addressed in this chapter.

3.2 Towards transition

To fulfil its vision NIFTEM wants proximity to the Indian food industry. What we learned is that for NIFTEM as a University with B.Tech, M.Tech and Ph.D programmes, it must shift partly towards a Contract Research Organization (CRO) to realise this proximity. In contract research, industries outsource their research to an external organisation or institute that can conduct these research services for them. Most often the reasons to outsource research activities for industry is to get access to talent and capabilities, gaining strategic benefit while focusing on their core business, risk-sharing, staffing flexibility, saving on infrastructure and technology and finally cost savings.

The contract research format, wherein industry pays an institute or university partly or fully to address its research questions, is a rather new concept in India. In this construct were industry outsources research to universities and contract research organisations the collaboration is set-up in such a way that the research is independent and scientifically sound. For both the industry and the universities and research organisations this is an absolute requirement and precondition.

While the Dutch industry has strong partnerships with universities, to the extent where even R&D centres of companies like Friesland Campina and Unilever are set up on the WUR campus, this is not the case in India. This was evident from our visit to NIFTEM for Phase 1 when a workshop was conducted for around ten Indian industry players (Annex 4). However, the interest in contract research was raised during this workshop. And, NIFTEM has extensive pilot and lab facilities in place that can be used for the transition towards a contract research format.

For this transition to be successful, NIFTEM must align more with the industrial organisations. This transition means incorporating contract research while maintaining current strengths (fundamental research, education, incubation, facilities, personnel, ...).

This transition towards contract research will impact NIFTEM through:

1. Organisation
2. Personnel
3. Funding

In the next paragraphs the impact on these three aspects will be further explored.

3.2.1 Organisational impact; a CRO within a Centre of Excellence Framework

As described above, to fulfil the mission and vision, doing (applied) contract research is a precondition. Fundamental and Contract Research are two sides of the same coin, connected but clearly different. Therefore, these two 'parts' of the organization should be connected and yet be different. A CRO requires a more client-oriented attitude in contrast with a lecturer attitude. Yet, both types of research require integrity and independence, adherence to good scientific conduct.

For NIFTEM to move on the path of doing Contract Research, besides Fundamental Research and teaching, means an organisational change that enables NIFTEM to grow, together with WUR, towards excellence in the focal topics 'Food Supply Chain solutions - Innovative and of Global Standards' and 'Greening of Food Sector - Waste and By-product Management'. Therefore, it is necessary for NIFTEM to focus on the impact of such a change on its organisation, its personnel and its funding (that will be addressed below) related to doing applied contract research.

An important insight is that the needed change is not in establishing and constructing Centres of Excellence (CsoE) as an organisational construct. It is in transforming NIFTEM (partly) to a CRO within a Centre of Excellence (CoE) framework, that moves NIFTEM, together with WUR, towards excellence on the two focal topics operationalized in executing industry driven applied contract research.

3.2.1.1 Define the purpose and focus areas

A crucial part of creating success is defining the purpose or goal of the organisational set-up, i.e. a CoE framework.

The goal for NITFEM is to strengthen their programs in Research and Value creation in the agri-food sector. To do so NIFTEM wants to lead its organization towards the development of a CRO. This would provide a focal point for knowledge management and therefore create the ability to capture new knowledge and practices from inside and outside of their organisation. It has been decided that NIFTEM uses the CoE framework for improving their expertise in two specific focus areas: (1) Food Supply Chain solutions - Innovative and of Global Standards and (2) Greening of Food Sector - Waste and By-product Management. Moreover, the CoE framework will help NIFTEM to generate resources in the long term, to help the organisation to improve and to develop industry driven applied research.

The purpose of the CoE framework is to enable new technologies to be adapted and implemented by the Indian food industry. But also, to develop new technologies to improve the Indian food industry. Indirectly, the CoE framework is also a means toward the development of a new business model, i.e. contract research for the Indian food industry supporting the organization towards partial resource generation in the long term/governing the organization through appropriate resource allocation.

3.2.2 Personnel impact; fit for industry driven contract research

The above-mentioned change towards a contract research organisation, also necessitates the acquisition of new skills such as certain project management practices, applied research abilities, business development skills, et cetera. Contract research implies that the research personnel develops the competence to translate industrial needs into an industry funded project and the competence to conduct industry driven contract research. Roles, responsibilities and accountability in the organisation should be clear, along with the clear distinction of doing science and delivering results to industrial clients.

Examples of different roles and needed competences in a CRO are:

Table 1: Specific Roles and Competences in a contract research organisation

Role	Description	Needed Competences
Business Development		
Business Developer	To scout for, screen and develop product and/or business development opportunities; to initiate, organise and coordinate support and advice in this regarding the area of research, education, social services and/or knowledge exploitation in accordance with the institution's knowledge valorisation policy with a view to contributing to business development, regional or otherwise, as a spin-off activity of the institution.	- Inventivity/creativity: Come up with new or original ideas, points of view or solutions. - Environmental orientation: Showing that he or she is well informed about social, political and job-related developments. Using this knowledge effectively for the benefit of his or her own job or organisation. - Sales skills - Communication skills
Project management		
Project manager	To initiate, execute, monitor and deliver projects (multidisciplinary or otherwise), including the set-up of the project definition and design of the project organisation, and additionally supervise internal project staff and/or third parties in such a way as to ensure that the formulated project goals will be fulfilled within the predetermined conditions as regards costs, quality, time, organisation and communication.	- Cost-consciousness: Being aware of the financial implications of his or her own actions and of the value of resources. - Persuasiveness: Succeeding in convincing others about ideas and plans. - Managing for results: Directing and steering staff or a project group in order to achieve the desired objectives and results. - Binding leadership: Creating synergy in a group of staff, encouraging mutual commitment and motivating staff to form effective alliances.
Project leader	To execute, monitor and deliver projects and supervise internal staff and/or third parties, based on project plans and in such a way that these project plans can be attained within the preconditions established in the area cost, quality, time, organisation and communication.	- Cost-consciousness: Being aware of the financial implications of his or her own actions and of the value of resources. - Persuasiveness: Succeeding in convincing others about ideas and plans. - Planning and organising: Overview of activities; set goals and priorities. Plan activities, time and resources. - Managing for results: Directing and steering staff or a project group in order to achieve the desired objectives and results.
Research		
Research Assistant	To prepare and perform the practical aspects of research and laboratory work according to instructions/protocols and applicable regulations, making use of existing methods, techniques and/or equipment, so that the research can be conducted in due time and in the correct manner and with optimum support.	
Junior Researcher	To conduct applied research projects, delineated or not, commissioned by clients in accordance with the group's annual plan and making use of existing or to be developed methods, with the aim of contributing to knowledge, recommendations, products, patents and insights relating to a particular field of research.	- Conceptual ability: Formulating views, ideas and concepts based upon complex information, and constructing conceptual frameworks or models - Environmental orientation: Showing that he or she is well informed about social, political and job-related developments. Using this knowledge effectively for the benefit of his or her own job or organisation. - Presenting: Presenting ideas and information clearly, taking the target group into account. - Result orientation: Focusing on the achievement of goals and of quantitative and qualitative results.
Senior Researcher	To acquire and perform demand-driven research projects and additionally report the results obtained at the request of clients in accordance with the group's annual plan with the aim of attaining the development of knowledge, products, patents and insight into a field of research.	

Funding impact; investment for transition

Transition towards a CRO will not come for free. Current budget and 'first mover projects' will not be able to carry these transition related costs, i.e.:

- Educate / train people
- Balancing workload
- Internal consultancy (legal, finance, ...)
- 'First mover discount'

To carry these costs a so called 'transition budget' is needed.
Also running such an organization is not for free. In the long-term, funding might not be a necessity, but at the start, NIFTEM will need capital to get going (beside the above mentioned 'transition budget'). For NIFTEM this means that it needs support for the entire process, not only in terms of time and expertise but also in monetary terms. Other possibilities are to find partners outside NIFTEM in areas such as technology, education or other such related sectors that fit the two focus areas. By partnering-up 'financial constructions' can be developed in which these partners for example pay a kind of 'member fee' that gives them the possibility use the facilities during 'idle time', have access to training facilities. Or in which technology providers install their equipment, including maintenance, for free. It is for NIFTEM to explore these possibilities in accordance to their goals, business concept and financial and legal regulations.

Therefore, a clear transition plan including an investment plan is needed (see chapter 4).

4 How to start?

4.1 Introduction

Based on the findings as elaborated upon in chapters 1, 2 we proposed an organisational transition of NIFTEM toward a (partly) Contract Research Organisation (as explained in chapter 3). Because a good transition requires a good structure and planning we will in this chapter look in more detail at the possible structured approach that could be used to optimize the chances of success for this transition.

4.2 A two-phase approach

We propose a phased approach for Phase 2 collaboration, leading to a gradual increase in investments from the industry. The Wageningen team suggests starting with 3 projects in Phase 2a.

Two small scale **show case projects** on the 2 focus topics with the following requirements:

- Well defined research questions, driven by industry and aligned with the needs of business partners
- Clear formulation of intended tangible results
- Connect with 'well known' business partners and be paid by them or offer them a 'first move discount'
- Projects run for 6 to 8 months
- NIFTEM in the lead (to show case the success of the institute in conducting applied-research in a contract research format)
- Gain for NIFTEM and WUR

A third project is to be defined on '**Building the Organization**'. Simultaneously to the before mentioned 'show case' projects this 'project' will run. During all the phases (idea, proposal, project plan, project execution, evaluation) WFBR will support the process. A separate budget is needed for this project as it involves support from WFBR's side for the effective transition of NIFTEM towards contract research.

An overview of Phase 2a is as follows:

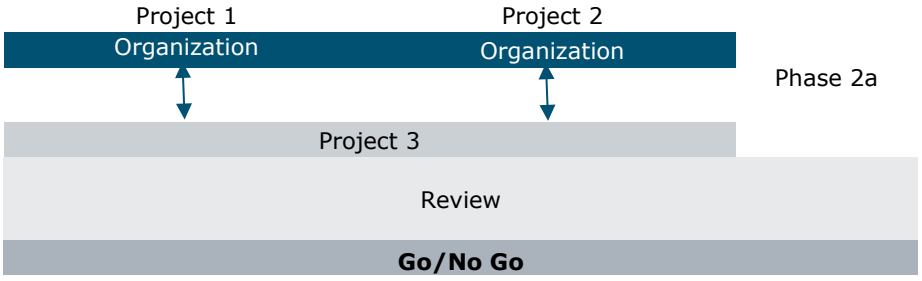

Figure 3: Phase 2a outline

- **Phase 2a**:
  - Two 'show-case' projects with reputed Indian/Global companies (= Projects 1 & 2).
  - One 'building the organisation' project (= Project 3)

- ***Review***: Evaluate the first 2 show case projects + estimate capacity/resources/feasibility of Phase 2b.

Go/No Go: Based on this decision and outcomes on the Review, both NIFTEM and WFBR will decide (1) if they want to proceed to Phase 2b (*both parties realize and accept in advance that the decision can be a 'No-Go'*) and (2) when continuation to phase 2b is a 'Go', the number and nature of projects in Phase 2b will be jointly scoped out.

A similar structure as in Phase 2a is laid out for Phase 2b with a possible increase in the number of projects as outlined:

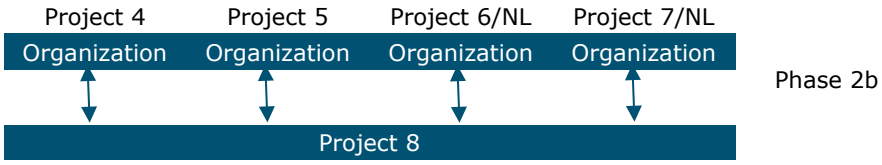

Figure 4: Phase 2b outline

- **Phase 2b**: Five projects planned initially (This can change in accordance with Review)
  - One 'building the organisation' project (= Project 8).
  - Two out of the remaining four are planned to be conducted in the Netherlands with visiting NIFTEM staff (to function as capacity building for NIFTEM staff) (= Projects 4, 5, 6 & 7).
  - A Public Private Partnership (PPP) model along with 100% industry-investment can possibly be planned, depending on the nature and scope of the projects.
  - Further, a mix of reputed companies and SME's/start-ups could possibly be incorporated in this Phase, in accordance with the scope of the projects.

- **Phase 3**: A final evaluation of all projects and the collaboration in general and a separate project proposal will be prepared after Phase 2.

The Indian industry have voiced their need for systems in place that will enable them to share their current research status and future needs, for example in the form of NDA's. In short, they wish to be comfortable and confident in sharing their current research topics and projects in the pipeline that are market-sensitive.

All the above necessitates specific support from WFBR and hence this has been planned in the form of separate projects: project 3 for Phase 2a and project 8 for Phase 2b. This includes an assessment of current NIFTEM's services and adapting them as needed.

It is also to be noted that NIFTEM and WFBR will not to conduct contract research through this CRO without involving the each other.

4.3 Suggested organisational structure / mode of operation

Within the framework of the CoE, exchange will take place of researchers, expertise and innovations and latest developments from both institutes. To enable this, both NIFTEM and WFBR must discuss and review the best options to realize this. Thus, although both organisations are aware that this is a process that must be completed together before it can be decided whether and how this cooperation and transition can be shaped, in this paragraph we already show a possible structure, as requested by NIFTEM.

4.3.1 The option of a combined 'physical and virtual CRO'

So, to be discussed, a possible outcome could be that the organization consists of two parts i.e. a 'physical CRO', taking advantage of the existing research facilities and pilot plants available at NIFTEM and WFBR and a 'virtual CRO'. The 'physical CRO' will be located at NIFTEM in India. This consists of the people, research equipment, buildings, et cetera for the daily operation of the centre (mainly doing

contract research). With a 'virtual CRO' we mean the operational structure guiding the collaboration between NIFTEM and WUR.

The suggested, and to be discussed, organisational structure is shown in Figure 5 below.

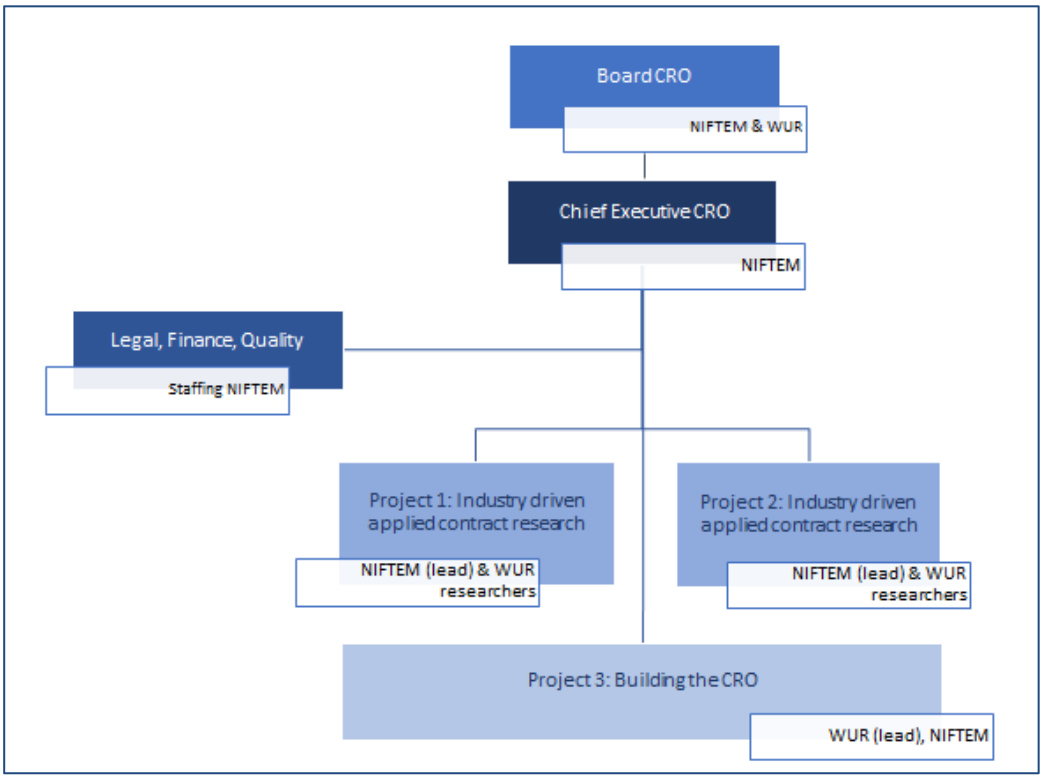

Figure 5: Potential organisational structure

4.3.1.1 A 'physical CRO'

Figure 5 shows a possible set-up of the CRO. If this option is considered feasible both for NIFTEM and WFBR, NIFTEM will be responsible for the daily operations of the CRO (by the Chief Executive of the CRO). Furthermore, if considered feasible we propose to organise a team within the current organisation of NIFTEM (see below) that will be responsible for both acquiring and executing the contract research projects. This team could be staffed both with persons that are already working for NIFTEM and that have the ambition, competences and drive to be part of the CRO, or new people from outside the NIFTEM organisation could be appointed. Of course, a combination is also possible. How to operationalize this is a business decision for NIFTEM to take.

In this possible set-up an important part of the physical CRO is thus staffing of the team. The CRO should be built around a team or a group of people, who can (as mentioned above) be hired either from outside NIFTEM or be employees of NIFTEM.

- When NIFTEM decides to assign current personnel to the CRO, it is of great importance that these persons are not only qualified and fit for contract research. They must be willing to make the transition towards contract research, meaning that they will have to leave their current career path of education and fundamental research. The advantage of staffing current personnel is that in the start-up phase, when there is probably still insufficient work, the persons could continue to fulfil a part of their current function. Of course, NIFTEM must find new staff to fill in the positions the current staff leave.
- When hiring new personnel NIFTEM can search for and choose the most suitable candidates with the knowledge and competences that are necessary. This also gives them the opportunity to gain knowledge of existing contract research organisations through these new people. A disadvantage might be that in the start-up phase, when there is probably still insufficient work, these newly hired persons will probably not be fully occupied with work. This possible financial pressure will have to be absorbed by considering it in the investments. An

alternative is to use these understaffed resources for teaching and fundamental research activities as a secondary focus.
- A third consideration is the business culture in which the CRO is going to be operational. Contract research is more business oriented than academic research and this is reflected in the culture. It is up to NIFTEM how to address this appropriately and cannot be done from the Dutch perspective and culture.

How to acquire new staff fit for the CRO is a business decision for NIFTEM to take. For the success of the CRO, NIFTEM should employ people who are highly qualified and skilled for the required positions. For this, they must identify the key skills required to achieve the objectives of the CRO (see also 'personnel impact' in Chapter 2).

Essential for this possible set-up is to place the governance structures at the heart of the operations with as little bureaucracy as possible to build a CRO that is agile, innovative and well governed. The purpose of the CRO is to find the best practices and this probably requires another governance approach compared to the operational structure of NIFTEM that is built for educational and fundamental research purposes. On the other hand, the centre's inner governance structure must be clearly laid out. There should be clear accountability and role structures in the centre to ensure employees are aware of the expectations and requirements they need to fulfil. For success, NIFTEM must ensure that the CRO has good support. Every member of the team must feel able to operate in an efficient and effective manner, without having to deal with operational problems and bureaucratic obstacles. For this it would be good to guarantee high level support within the organization.

4.3.1.2 A 'virtual CRO'

In this possible set-up of the CRO we focus on the fact that NIFTEM and WFBR do not have to place personnel within each other's organization to set up and run the CRO. This is what is suggested by a so-called 'virtual CRO'. As described above, if this option is considered feasible both for NIFTEM and WFBR the daily operation of the CRO will be done by NIFTEM providing the people and (research) facilities. In this set-up WFBR will organise and execute the guidance and support via so-called remote working and where necessary by exchanging experts through field missions. This suggested guidance and support will be on three 'levels':

- Board level: One member each at high-level management of both NIFTEM and WFBR should be responsible for the strategy and vision of the CRO. This to assure quality assessments of the projects conducted through the CRO. They also formalize the form of cooperation and jointly decide on contingent cooperation. It is suggested that this so-called board consisting of two persons meet virtually 3 to 4 times a year;
- Services level (i.e. Legal, Finance, Quality, ...): The CRO could make use of the facilities and people already working for NIFTEM with support from WFBR;
- Project level: The suggestion would be that each of the three projects in Phase 2a will be staffed based on the necessary expertise and desired or necessary matching between expertise on the side of NIFTEM and WFBR. The projects would be organised based on the needed expertise of the concerning project. In the possible set-up we suggest that there should be the possibility for project members from WFBR to visit NIFTEM for 1 to 2 weeks during the execution of the project activities.

4.4 Contract Research Organisation in a Centre of Excellence Framework

It is essential to note that the previous chapters are based on the conviction that a transition towards a CRO is needed within NIFTEM in a CoE framework.

It is necessary for NIFTEM to focus on the impact on its personnel, organisation and funding related to doing applied contract research. In the process of organising this, NIFTEM will be able to excel on the focal topics. So, the needed change is not in establishing and constructing two CsoE as an

organisational construct. It is in transforming NIFTEM (partly) to a CRO that moves NIFTEM, together with WUR, towards excellence on the two focal topics and operationalized in executing industry driven applied contract research (= the so-called CoE framework).

In summary:

A. A prerequisite in developing excellence on the two predetermined focal areas (Food Supply Chain solutions - Innovative and of Global Standards and Greening of Food Sector - Waste and By-product Management) is conducting excellent research relevant to the Indian food industry;
B. To conduct 'industry driven and industry relevant research' it is essential to align the research organisation and the way of doing research to how (industrial) companies outsource their research and development;
C. Therefore, the governance structure of NIFTEM must (partly) change to an organisation fit for acquiring, conducting, and evaluating contract research, i.e. a CRO;
D. Transforming to a CRO also means that personnel, the organisational governance and the way of funding must change to fit the execution of contract research;
E. And within the contract research part of the entire NIFTEM organisation, the development towards being excellent on the two predetermined focal areas, namely (1) Food Supply Chain solutions - Innovative and of Global Standards and (2) Greening of Food Sector - Waste and By-product Management, will be arranged in accordance of the CoE framework.

4.4.1 To be noted

The proposed 'next steps', described in this report as Phase 2a, Phase 2b and Phase 3, are based on the findings of Phase 1 (= outcome of the scoping mission) and proposed by Wageningen team as the most applicable and suitable way for NIFTEM and WUR to go forward in their ambition to assess the possibilities of collaboration and the feasibility of setting up a 'NIFTEM CRO' within a CoE framework. The results of Phase 1 presented in this report are to be used as input for further discussion within the decision-making process between NIFTEM and WUR/WFBR on what the next steps should actually be and how the cooperation should look like. The decision-making process itself is not part of this report. The outcomes of the decision-making process may be different than the possibilities mentioned in this report.

5 Proposed timeline

5.1 Introduction

The phased development or transition plan described in chapter 4 will be related to a planning in this chapter. In this planning we will describe what activities are needed and when, who is responsible and what the deliverables are.

5.2 Activities, timelines and deliverables

The following timeline is proposed for the phased development plan:

Table 2: Proposed timeline for the phased development plan

Jun 2019	**After internal discussions at WUR, a detailed plan for Phase 2 to be sent to NIFTEM**	**Phase 1 ends**
Jul - Sep, 2019	Signed contract for Phase 2 First project plans for the projects 1&2 Preparations for Phase 2	Phase 2 planning
Oct 2019	Phase 2 starts. Possible Phase 2 kick-off when the Dutch King and Dr. Raoul Bino visit India Nice moment for publicity for MOFPI, NIFTEM and WUR	Phase 2 kick-off
Nov 2020 - Jun 2020	Start execution of projects 1 and 2 of 6-8 months duration Simultaneous execution of project 3	Phase 2a
Jul - Aug 2020	Evaluation of the first two projects How many projects can you do/are possible to execute simultaneously Go/No Go decision to be taken individually by NIFTEM and WFBR Either Institute can decide to continue/discontinue Possible discontinuation of Phase 2b based on the outcomes of the Review	Review Go/No Go
Sep 2020- Apr 2021	Project plans & execution of projects 4,5,6 & 7 2 projects to be carried out in NL using Dutch facilities, where NIFTEM staff will conduct research in NL and this would include capacity building for them Simultaneous execution of project 8	Phase 2b
May-Jun 2021	Phase 3- Final evaluation	Phase 3

5.3 Proposed activities for Phase 2

Planning for Phase 2 (NIFTEM & WFBR)

- Identification of projects and clients for projects 1 & 2 (joint effort)
- Drawing up and finalizing project plans (joint effort)
- Finalizing phase 2 content, agreement and budget (joint effort)
- Setting-up concrete timelines & resources for Phase 2 (joint effort)
- Organizational: Appointment of two representative heads from both NIFTEM & WFBR (joint effort)
- Quality assessment: of first two project proposals by both heads (joint effort)
- Arrangements for official opening/kick-off of the CRO (joint effort)
- Hiring new personnel as necessary (NIFTEM)
- A visit to India by two WFBR staff for planning stage for three days.

Deliverables activity 'Planning for Phase 2' :

1. Two project proposals and finalized contracts with reputed companies for 'Show-Case projects'
2. Organizational set up for phase 2a

Phase 2a

- Execution of Projects 1 & 2 (NIFTEM in lead with support from WFBR as necessary)
    - Conduct research experiments & deliver products/formulations/reports to client (NIFTEM in lead)
    - Marketing of the 'show-case' projects. This could be in the form of web articles/ speaker slots at events (joint effort)
    - Identify and approach clients plus find funds for projects 4-7 (NIFTEM in lead)
- Execution of project 3 (WFBR in lead with support from NIFTEM as necessary)
    - Inventory of the current organizational systems at NIFTEM and adopting them for the Contract Research Organization (CRO) which could possibly include:
        - NDA's and other legal term sheets
        - Introduction of contracts/agreements
        - Specific webpages highlighting the value-propositions to be written
        - Time keeping systems for project management to be set up/adapted
        - Finance systems and control systems for risk-assessments to be set up/adapted
    - Any other activities deemed necessary for successful project execution
    - Research expertise & know-how to be provided as necessary on a project-to-project basis
    - Evaluation of the designed CRO
    - A three day visit to NIFTEM by three WFBR staff supporting the executing of project 3 and for the three industry-workshops/events to be conducted as listed below:
        - Organizing a network event for SME's and start-ups to come up with business model(s) for low-capex companies (NIFTEM organizes, workshop by WFBR)
        - Workshop to incorporate farm-level projects. This would include a brain-storming session on possible funding bodies (NIFTEM organizes, workshop by WFBR)
        - One networking event for the industry is to be conducted (NIFTEM organizes, workshop by WFBR)
- Plan & develop a network platform for Indian and Dutch industries (NIFTEM in lead, WFBR support)
- Market research study within the scope of the two topics (Food supply chain innovations and Greening of the food sector) to map out in detail market-needs that can guide the research agenda of the CRO (possibly include focus group interviews with NIF, primary, secondary and literature surveys) (joint effort)

Deliverables activity 'Phase 2a':

1. Execution of projects 1,2 & 3
2. A short report summarizing the market research study
3. A short report summarizing value propositions for low-capex companies
4. A short report summarizing possible farm-level projects

5. An online industry-network platform

Review (WFBR)

- An assessment of projects 1,2 & 3 (WFBR)
- Feedback from industry on their satisfaction with projects 1 & 2 (NIFTEM)
- Feedback from NIFTEM on their satisfaction with project 3 (NIFTEM)

Go/No Go: Joint decision for continuation/discontinuation to Phase 2b

Deliverables activity 'Review':

1. A short management-style assessment report to be submitted by WFBR to NIFTEM on the assessment of projects 1-3
2. Joint decision for continuation/discontinuation to Phase 2b

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Phase 2b (This can change in accordance with review and Go/No Go)

- Finalize project plans for projects 4-7 (joint effort)
- Make a concrete plan and budget for Phase 2b regarding its capacity and number of executable projects
- Execution of Projects 4,5,6 & 7 (NIFTEM in lead with support from WFBR as necessary)
    - Conduct research experiments & deliver products/formulations/reports to client (NIFTEM in lead)
    - Conduct two research projects in the Netherlands & deliver results to client (WFBR in lead)
    - Marketing of the projects. This could be in the form of web articles/speaker slots at events (joint effort)
- Execution of project 8 (WFBR in lead with support from NIFTEM as necessary)
    - Support NIFTEM staff during their visit to the Netherlands
    - Support with exposing/introducing NIFTEM staff to the Dutch food industry
    - Conduct capacity-building activities for NIFTEM staff
    - Any other activities deemed necessary for successful project execution
    - Research expertise & know-how to be provided as necessary on a project-to-project basis
    - Introduce NIFTEM staff to StartLife and StartHub (start-up incubators at WUR)
    - Tour of research facilities at WFBR
- One networking event for the industry (WFBR)

Deliverables activity 'Phase 2b':

1. Execution of projects 4-8

5.4 Budget estimate for Phase 2a

Table 3: Budget estimate for NIFTEM for Phase 2a

		Total cost
Hiring four new personnel*	Cost for ~1-year duration of Phase 2a	₹66,00,000/-
-One personnel at Professor level (Program Manager for CRO)	₹24,00,000/-	
-One personnel at Associate Professor level (Senior Scientist for CRO)	₹18,00,000/-	
-Two personnel at Assistant Professor level (One as Scientist for CRO, the other as Business Developer for the CRO)	₹24,00,000/- (each personnel at ₹12,00,000/-)	
Travel costs		₹29,000/-
-Phase 2 kick off in Delhi	₹4,000/-	
-Phase 2a, Marketing 2 'Showcase' projects at events	₹25,000/-	
Material for Phase 2a projects – "first mover" discount	₹15,00,000 for each project X 2	₹30,00,000/-
Buffer funds for Phase 2a (As it is difficult to estimate project costs at this stage, where project plans have not yet been drawn upon)		₹40,00,000/-
	Grand total in INR	₹1,36,29,000/-
Overhead @10%	₹13,62,900/-	
	****Total budget in INR**	**₹1,49,91,900/-**
	(@€=80INR) Total budget in Euros	**€187,399,-**

*Average yearly cost of hiring personnel for NIFTEM has been estimated by WFBR as follows:

Professor level: Rs. 24,00,000/-

Associate professor level: Rs. 18,00,000/-

Assistant Professor level: Rs. 12,00,000/-

The above figures are to be verified by NIFTEM.

**Final budget for NIFTEM is considering the hiring of four fulltime personnel for Phase 2a. After Review1, if necessary, four more personnel could be further hired for Phase 2b execution.

Table 3: Budget estimate for WFBR for Phase 2a

	Total cost including overhead
Planning Phase 2	€28,086,-
Phase 2a	€104,641,-
Review	€18,308,-
Travel costs & DSA, Total	€11,200,-
-Planning & kick-off of CRO	€3,800,-
-Phase 2a Marketing	€2,300,-
-Phase 2a project 3 execution	€5,100,-
Total budget in euros	**€162,235,-**
Total budget in INR (@€=80INR)	**₹1,29,78,800/-**

Table 4: Final budget estimate for Phase 2a

	Budget in INR	Budget in euros
NIFTEM budget	₹1,49,91,900/-	€187,399,-
WFBR budget	₹1,29,78,800/-	€162,235,-
Grand total budget	**₹2,79,70,700/-**	**€349,634,-**

All budget estimates are exclusive of any applicable direct, indirect or any other taxes.

Note: Depending on the outcome of the Review, a budget for further continuation must be drafted in the initial activities of Phase 2b.

5.5 Overview of potential external partners

- Niftem Industry Forum (http://www.niftem.ac.in/site/Internal_NIFTEM.aspx?menulevel=2&MenuID=104)
- National Research Institutes in India, Project specific
- Food Safety and Standards Authority of India (FSSAI)
- Technology providers, Project specific, for example Danfoss
- Dutch partners, Project specific

6 Conclusion

Based on the findings of the scoping visit, this detailed report has been prepared for Phase 2, wherein the "Establishment of a CRO" could take form. This report serves as a starting point for making the CRO operational, in addition to laying out its organizational structure.

The aim of the CRO is to strengthen NIFTEM's programs in "Research" and "Value Creation" and give footing for WUR in India through customizing WFBR's experience and know-how in conducting applied research in a contract research format for the Indian food industry and simultaneously develop towards being excellent on the two predetermined focal areas (1) Food Supply Chain solutions - Innovative and of Global Standards and (2) Greening of Food Sector - Waste and By-product Management within the CoE framework

The estimated needed budget for Phase 2a along with a phased transition plan (Phases 2a and 2b) for the CRO has been laid out. Continuation to Phase 2b strongly depends on the outcome of the review (and Go/No Go decision by both collaborators). With this proposal, we ask NIFTEM to agree to the proposed phased development plan and the budget for laying down the basic structure for the CRO.

Annex 1 Program Scoping Visit

Table 5: Program Scoping Visit May 15 – 17, 2019

15 May 2019		
Meetings & interviews with NIFTEM staff + tour of the facilities		
9:45	Arrive at venue	
10:00	Introductions	
10:15	Presentation on NIFTEM	Ashutosh Upadhyay, Professor, NIFTEM
11:00	Presentation on WUR	Eelke Westra, Program Manager, WFBR
11:30	Presentation on WFBR	Joost Snels, Senior Program Manager & Expertise Leader, WFBR
12:00	Lunch	
13:00	Tour of the facilities	
14:00	Interviews with NIFTEM staff	
15:30	Tea break	
15:45	Interviews continued until 17:00	
16 May 2019		
Workshop with stakeholders (internal & external)		
10:00	Presentation of WUR to Indian industry	Eelke Westra, Program Manager, WFBR
10:30	Discussion with industry stakeholders	
12:00	Lunch	
13:00	BMC workshop with NIFTEM	Swathi Vurrakula, Business Development Manager India, WFBR
15:30	Long tea break- Team assess and distil outcomes of BMC	
16:00	Concluding discussions & finalization of the Business Model	
17 May 2019		
Drafting a work plan for themes, programs, feasibility& modes of operation		
10:00	Creating content and a draft plan for phase 2	
12:00	Lunch	
13:00	Presentation of the draft plan for Phase 2 to NIFTEM	Joost Snels, Senior Program Manager & Expertise Leader, WFBR
15:00	Closing discussions, evaluation and feedback on draft plans by NIFTEM	

Annex 2 Presentation on WUR and WFBR (Day 1, May 15th)

Wageningen's domain: Food and Living Environment

Two partners

Wageningen University & Wageningen Research

Wageningen University & Research

'to explore the potential of nature to improve the quality of life'

- No. 1 in our domains
- Top 100 worldwide in university ranking
- Exploitation and valorisation of research

Partners

Wageningen University

Wageningen Research

- 11,278 BSc/MSc students from 103 countries
- 1,900 PhD candidates
- 2,523 FTE of faculty and staff
- Scientific Publications: 4,064
- Patents & Licences: 81
- Turnover: €336 million

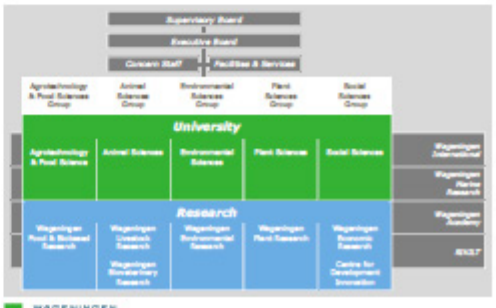
Partners

Wageningen University

Wageningen Research

- 2,389 FTE of staff
- Scientific Publications: 1,356
- Patents & Licences: 171
- Turnover: €299 million

Organisational structure



Organisational structure

Wageningen Food & Biobased Research

- Market oriented R&D approach
- Connection with the university of Wageningen
- Up-scaling: from lab to pilot
- From idea to processes and products

The Wageningen approach

- No one-dimensional solutions for urgent challenges, therefore: multidisciplinary approach and open connections between scientific and social science disciplines
- Cooperation between university and market-oriented research institutes
- Close collaboration with government authorities, the business community, research institutes and other universities

Dutch collaboration model

Combining strengths in cooperation within the "Golden Triangle"

Research programmes @ WFBR

- Postharvest quality
- Food waste prevention & utilisation
- Food innovations for responsible choices
- Smart customised nutrition & health
- Protein for life
- Biobased chemicals & fuels
- Renewable materials
- Biorefinery

Facilities

Unique

State-of-the-Art

Content

Objective

Finding ground for collaboration with NIFTEM

1. Wageningen University & Research
   - Organisation
   - Food & Biobased Research
2. Impact

Practical solutions for complex issues

- Developing sustainable innovations for our customers
- In-depth knowledge of the entire agrifood chain
- Connecting agrifood with chemistry, materials and energy production
- Multi-disciplinary applied R&D project teams

Results food research

- Longer shelf life of processed foods with higher quality
- Food waste reduction
- High speed 3D vision controlled manipulation robots
- Strategy development and design of agrologistics concepts
- Protein-rich meals to prevent malnutrition in the elderly
- Preserving bio-availability of new functional drink

Pasteur chip reduces food waste

Challenge
- Reducing waste by measuring actual shelf-life of products

Solution
- Development of quality models for vegetables, fruit and meat
- Dynamic shelf life based on conditions registered
- Smart sensor tag developed for fruit, vegetables and meat

Impact
- Tags showing origin, conditions of transported and product's actual shelf life
- Pasteur sensor tag ready to be produce by NXP for industry (0.02-0.10€/chip)

Flower shipped over Sea

Challenge
- Transport or storage time over 3 weeks
- Maintain vase life of flowers

Solution
- Define transport protocol for cooling and handling
- Adapt packaging to new transport method
- Understand what quality attributes are effected by elongation of transport

Impact
- Cost reduction while maintaining flower quality
- Lowering CO_2-emissions by 40%
- >100 container with flowers per week world wide

WAGENINGEN

Automatic crop sorting

Challenge
- Automatic quality based crop sorting
- Reduce staff during crop harvest

Solution
- Develop an accurate model of the product for shape analysis
- Measure features by colour, x-ray, chlorophyll or NIR sensors
- Determine quality to enable automatic sorting

Impact
- Robust and objective seedling evaluation as accurate as a human expert
- Meticulously inspection and sorting of 400.000 plants per day
- Implemented for different plants, such as roses, cactuses, orchids & tomatoes

WAGENINGEN

New storage technology for fruit supply chain

Challenge
- Store year-round Dutch apples and pears and assure high eating quality

Solution
- Built a consortium of cooperatives & pack houses in fruit supply chains
- A novel patented DCS™ system using fruit metabolites/volatiles signals

Impact
- Growing market (retailers) demand for DCS™ fruits because of its superior quality
- Worldwide use of DCS™ based systems
- Demand still exceeds offering

WAGENINGEN

Cool - Research on the move

Challenge
- Postharvest Research on location

Solution
- Movable research facility
- 40ft container with 10 climate chambers for temperature, humidity, oxygen, carbon dioxide, ethylene
- Plug and play

Impact
- Direct results with local production
- Research possible anywhere in the world
- Also in regions with limited research capacity

WAGENINGEN

European Partnerships on Food Waste

Challenge
- Increase resource efficiency throughout the whole supply chain, and contribute to 50% less food loss in EU in 2020

Solution
- A European Multi-stakeholder approach for food use optimization & social innovation

Impact
- Harmonization of food waste monitoring & assessment
- A comprehensive multi stakeholder platform
- Best practices of social innovative measures for optimized food use in the food chain
- A Common Food Waste Policy for EU27
- Technological innovations to improve valorisation of food waste

FUSIONS

Refresh

WAGENINGEN

Questions

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To explore the potential of nature to improve the quality of life

WAGENINGEN

Strategic collaboration NIFTEM & WUR

The way we work

May 15, 2019 Joost Snels

For this morning

- Introduction
- How we work at WFBR
  - From fundamental to applied research
  - From idea to project
- How we collaboration with industry

Joost Snels

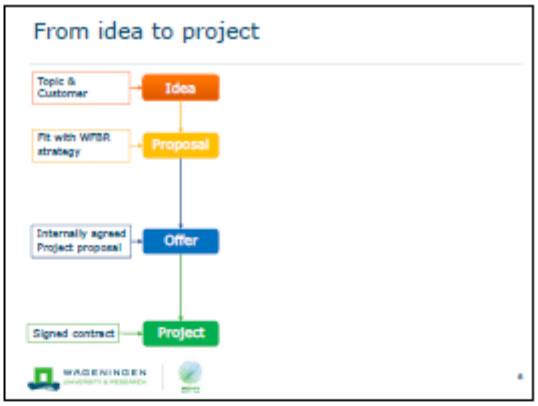
- Background in
  - Logistics
  - Supply Chain Management
  - Business Economics
- Worked for private company (paper trading) and the government (Ministry of Transport, Public Works and Water Management)
- 18 years for Wageningen UR Food & Biobased Research

How we work at WFBR

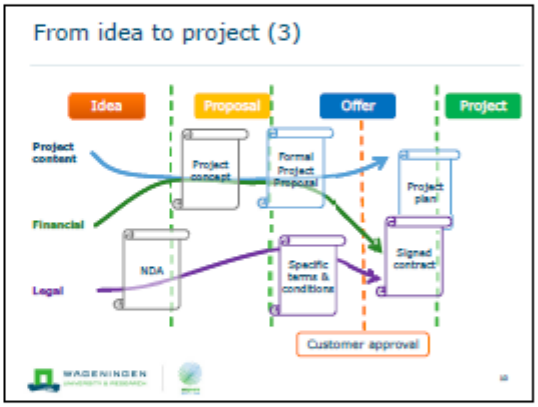
From fundamental to applied research

From fundamental to applied research

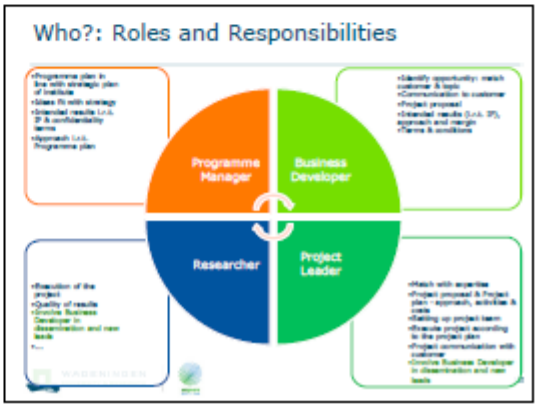

How we work at WFBR
From Idea to Project


From idea to project
Topic & Customer
Idea
Fit with WFBR strategy
Proposal
Internally agreed Project proposal
Offer
Signed contract
Project


From idea to project (2)
Topic & Customer
Idea
Programme Manager
Approval to spend time on acquisition
Fit with WFBR strategy
Proposal
Project Leader
Research Manager
Approval to submit proposal
Approval to send project proposal to customer
Internally agreed Project proposal
Offer
Programme Manager
Project Leader
Approval to sign contract
Approval to start project
Signed contract
Project


From idea to project (3)
Idea
Proposal
Offer
Project
Project content
Financial
Legal
Project concept
Formal Project Proposal
Project plan
NDA
Specific terms & conditions
Signed contract
Customer approval


From idea to project (sum)
Idea
Initial exploration; assess market needs/value
Bid/No bid: spend time on this acquisition?
Proposal
Define objective, approach, deliverables, terms
Approval for project proposal: activities & budget
Offer
Agree with customer on full contract
Signed contract: BD transfers ownership to PL
Project
Execute project to plan & spot new opportunities
Project evaluation; happy customer?


Who?: Roles and Responsibilities
Programme Manager
Business Developer
Researcher
Project Leader

Who?: Roles and Responsibilities (2)

- Programme Manager:
  - Programme plan in line with strategic plan of institute
  - Programme plan with clear propositions
  - Ideas/project fit with strategy and programme plan
  - Intended results i.r.t. IP & confidentiality terms
- Business Developer:
  - Identify opportunity: match customer & topic
  - Communication to customer
  - Project proposal
  - Intended results (i.r.t. IP), approach and margin
  - Terms & conditions

Who?: Roles and Responsibilities (3)

- Project Leader:
  - Match with expertise
  - Project proposal & Project plan - approach, activities & costs
  - Setting up project team
  - Execute project according to the project plan
  - Project communication with customer
  - Involve Business Developer in dissemination and new leads
- Researcher:
  - Execution of the project
  - Quality of results
  - Involve Business Developer in dissemination and new leads
  - ...

How we work (sum)

- Clear definition of roles and responsibilities for both:
  - Type of research
  - Defining industry projects
- Continues process to stay connected with the market in the process of getting from idea to project
  - From fundamental research to applied research
  - From strategy to project execution

How we cooperation with industry

Cooperation with industry on multiple level

- IP valorization and licensing
- Secondment
- Certification: ATP test facility for temperature controlled transport
- Professional education
- Network of alumni

Cooperation (2)

- Entrepreneurial drive:
  - StartLife empowers founders to build and grow Food & Agtech start-ups with lasting impact
  - StartHub Wageningen is the incubator for start-ups of current and recently qualified Wageningen (PhD) students.
- Shared Research Facilities
  - Providing researchers the opportunity to use the advanced research equipment of Wageningen University & Research for all researchers and companies

Cooperation: Centre of Excellence

WAGENINGENUR/CHILE
KNOWLEDGE IN ACTION

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What is Wageningen UR/Chile?

- One of four 'International Center of Excellences' in Chile
- Topic: Food Science
- Financed by the Chilean Economic Development Agency (CORFO)

CORFO

Other ICE's are:

- Mining, Energy, water and climate issues (CSIRO)
- Communications, information research and Innovations center (INRIA)
- Center for Systems Biotechnology (Fraunhofer)

WageningenUR/Chile

- Start 2012
- Director WUR
- Five projects:
  1. Stevia
  2. Quinoa
  3. Novel Processing
  4. Avocado Oil
  5. FruitChange

Goal of WageningenUR/Chile

- Promoting the formation and maintenance of new capacities and distinctive scientific and technological infrastructure
- Generating results in R&D, new knowledge and technological breakthroughs, with applicability and relevance for the productive development of the country
- Establishing and strengthening the development of local capacities through alliances between the ICE and local scientific and technological research entities and centres

One of the pilots: FruitChange

- AIM:

Develop a superior global fresh fruit supply chain by optimization of the postharvest pre transport phase and including protective packaging, focus on:

- Avocado
- Table grapes

Logistical chain of fresh products

Business and Research

- Business
  - Problem owner
  - Access to product
  - Hughe practical experience
  - Know how of value chain
- Research
  - Solution driven
  - Access to knowledge
  - Hughe experimental experience
  - Know how of science

Partners: Business and Research

Chili

- Companies
  - Subsole
  - Santa Cruz
  - Agrofresh
- Research
  - INIA
  - USACH

Netherlands

- Companies
  - Bakker Barendrecht
  - Westfalia
- Research
  - Wageningen UR Food & Biobased Research

Centre of Excellence

- Developing innovation by running projects together
  - In total 5 projects
  - 100% governmental funding (Chili)
  - Exchange of knowledge and expertise
- Re-evaluated after 4 years
  - Main discussion about organisation, expertise transfer and funding

Thank You!

Contact information:
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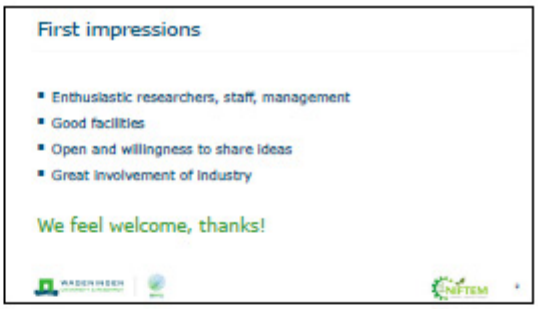
Annex 3 Final presentation (Day 3, May 17th)



Mission / Vision

- Creating impact for the Indian food industry and their customers / consumers
- For this NIFTEM wants close proximity to the Indian food industry
- To incorporate Applied Research within NIFTEM to:
  - fulfil the needs of the Indian industry
  - strengthen the position of NIFTEM towards self-sufficiency
- Transition to applied research while maintaining current strengths (fundamental research, education, incubation, facilities, personnel, ...)

Transition towards applied research

- This will impact:
  - Personnel
  - Organisation
  - Transition funding

Personnel

- Competence development
- Roles & Responsibilities and Accountability
  - Idea → Proposal → Project → Execution → Feedback
- Project execution / applied research
  - Promised results vs. Doing research

Organisation

- Fundamental and Applied Research are two sides of the same coin, connected but clearly different
- These two 'parts' of the organization should be connected, but clearly different

Organisation (2)

- Legal / finance
  - Client specific Terms & Conditions (NDA)
  - Pricing of research (hours, facilities, overhead, ...)
- Project management, especially time keeping
- Customer Relation Management
- Commercialising
  - Clear distinction between 'University' and 'Applied Research' (internal competition / giving expertise for free)
- Feedback loop / customer satisfaction

Transition Funds

- Transition will not come for free
- Current budget and 'first mover projects' will not be able to carry these cost
  - Educate / train people
  - Balancing workload
  - Internal consultancy (legal, finance, ...)
  - 'First mover discount'
- Transition plan incl. investment plan is needed

How to start? → 3 projects

- 2 small scale **show case** projects on the 2 topics (CoE)
- Well defined research questions, driven by industry and aligned with the needs of business partners
- Clear formulation of intended tangible results
- Connect with 'well known' business partners and be paid by them
- Running for 6 to 8 months
- NIFTEM in the lead

Project #3: 'Building the organisation'

- Simultaneously to the beforementioned projects this 'project' will run
- 'Learning by doing': During all the phases (idea, proposal, project plan, project execution, evaluation) WFBR will guide the process

What is next?

Jan 2019	After internal discussions, detailed plan for Phase 2 sent to NIFTEM
Sep 2019	Signed contract
Oct 2019	Phase 2 starts. King and Raoul Nna visit India. Formal opening or kick-off for the two CoE's. Nice moment for publicity
Nov-Dec 2019	Final project plans for the 2 projects
Jan 2020- Jun 2020	6 months duration — Phase 2a
Jul-Aug 2020	Evaluation of the first two projects, how many projects can you do/ is possible
Sep 2020- Apr 2021	Projects plans for 4 projects, 2 projects to be carried out in NL using Dutch facilities, where NIFTEM staff will conduct research in NL and this would include capacity building for them. — Phase 2b
May-Jun 2021	Evaluation of Phase 2b, development of plan for Phase 3

Deliverables at the end of Phase 1 (End of June)

- A brief report which captures the key findings & recommendations, consisting of:
  - A business model canvass (BMC) for both CoE's
  - A phased development plan for WUR-NIFTEM partnership (2019-2021) focused on the two CoE's
  - A clear joint objective/vision of the WUR-NIFTEM collaboration
  - An activity plan including timelines
  - An approximate budget and possible funding mechanisms
  - An overview of potential external partners

Thanks!

Annex 4 Industry representation (Day 2, May 16th)

Table 6: Industry members present a NIFTEM May, 16

16 May 2019
Industry members present for discussions
FSSAI
Dupont
Container Corporation of India
KP Pvt. Ltd
BTW India
The Society of Indian Bakers
Innerbeing
PepsiCo India Holdings Pvt. Ltd.
Shineroad foods (India) Pvt. Ltd.
SME's – dairy farmers

PepsiCo and Shineroad foods have listed specific research needs and they are considered as a good starting point for projects 1 and 2 for Phase 2a.

To explore the potential of nature to improve the quality of life

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Report 1961

The mission of Wageningen University and Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 10,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.